DISSERTATION
ON

"A STUDY TO ASSESS THE EFFECTIVENESS OF CALISTHENIC EXERCISES IN REDUCING STRESS AMONG NURSING STUDENTS IN A SELECTED COLLEGE OF NURSING AT CHENNAI"

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CHENNAI-600 032.

CERTIFICATE

This is to certify that the dissertation titled **"A study to assess the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai"** is a bonafide work done by Mrs. P. Abirami, M.Sc Nursing II year Student, College of Nursing, Madras Medical College, Chennai-3 submitted to The Tamil Nadu Dr. M.G.R Medical University, Chennai, in partial fulfillment of the requirement for the award of degree of Master of Science in Nursing ,Branch-V, Mental Health Nursing, under our guidance and supervision during the academic year 2016 -2018.

Mrs.A.Thahira Begum, M.Sc (N)., M.B.A., M.Phil.,
Principal,
College of Nursing,
Madras Medical College,
Chennai-03.

Dr.R.Jayanthi, M.D., F.R.C.P.,(Glasg)
Dean,
Madras Medical College,
Chennai-03.

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Approved by the dissertation committee on 11.07.2017

Research Guide

Mrs. A. Thahira Begum, M.Sc (N)., M.B.A., M.Phil., _____
Principal
College of Nursing,
Madras Medical College,
Chennai-03.

Clinical Specialty Guide

Mr. M. Nithyanantham, M.Sc (N)., _____
Reader Head of the department,
Department of Psychiatric nursing,
Madras Medical College,
Chennai-03.

Medical Guide

DR.V.Venkatesh Mathan Kumar, M.D., _____
Professor,
Institute of Mental health,
Kilpauk,
Chennai -10.

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ABSTRACT

Calisthenic exercises leads to an improvement in overall strength and energy to the body, in turn promoting overall health. Calisthenics also improves mental health, which in turn helps in treating depression, stress, anxiety and the like. **Title:** "A study to assess the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai **"Objectives:** To assess the level of stress and find out the effectiveness of calisthenic exercises, associate the post test stress score with their selected demographic variables among nursing students. **Methods and materials:** A pre experimental design was chosen Non probability convenient sampling technique used to select the sample.60 nursing students were the sample. Perceived stress scale was used to assess the nursing students stress. **Results**: In pretest, the nursing students stress score was 23.12 after the administration of calisthenic exercise the post test stress score was 14.18 Difference is 8.94.It was statistically significant at $p<0.001$ level. **Conclusion**: Statistical significance was calculated by using chi square test and one way Anova-test, student paired t-test. After calisthenic exercise the stress level has reduced among nursing students. So calisthenic exercise has significant impact in reducing the stress among nursing students.

Key words: stress, nursing students, calisthenic exercises,

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ABBREVIATION	EXPLANATION
RGGGH	Rajiv Gandhi Government General Hospital
HOD	Head of the Department
SD	Standard Deviation
DF	Degree of Freedom
WHO	World Health Organization
ESV	Effect Size Values
PSS	Perceived Stress Scale

CHAPTER I

INTRODUCTION

"Being active can boost your feel good endorphins

And distract you from daily worries"

– Mayo clinic staff.

Health is a state of complete physical, mental and social well being and not merely an absence of any diseases or infirmities-WHO. This implies that disease in humans can occur due to physical, mental or psychological disturbances. In today's fast growing society and increase in demands, stress is thought to play a major role in illness, causation of diseases and disabilities at all ages[1].

Stress has been identified as a 20th century disease and has been viewed as a complex and dynamic transaction between individuals and their environments[2]. Stressors can be broadly defined as situations or events that have the potential to affect health outcomes[3]. Stress can be regarded as a psychological threat, in which the individual perceives a situation as a potential threat[4].

Stress refers to a forceful interaction between the individual and the environment. In this interaction and boundaries related to work may be apparent as threatening to exceed the person's resources and skills[5].Stress is not equal with nervousness or anxiety but also provides the originality, abilities and energies; though it can cause tiredness and sickness, either physical or psychologically. Stress is a psychological factor that influences the academic performance[6]. Although every profession is effected by stress but the health professionals are more at risk to stress especially nursing profession[7].

Stress or anxiety is not only a workplace problem but different stressors can also effect the students, which may be stress related to academic performance, or may be due to difficulty to adapt the

environment of a new organization. The students may face stressors like social, environmental, academic, emotional, personal, and family. These stressors might disturb the learning ability and academic performance of the students[8]. The most often reported stressors were failure and uncertainty related to performance and expectations for clinical practice[9].

Negative insight towards nursing profession, disrespectful attitude towards nurses and embarrassing behaviour, lack of self-confidence, thinking mistakes, not able to state self and not able to manage time are combined sources of stress in nursing students also the theoretical training, as a result of the above mentioned problems, students have indicated to rapidity conflicts in their individual, household as well as practical lives[10]. The cause of stress connected to the student doesn't want to contribute in the courses, study load, the anxiety of not being competent to grow up, low levels of course[11].

Nursing students experience a high level of stress and anxiety throughout their education. In fact, nursing students experience more anxiety, especially test anxiety, than students from any of the healthcare disciplines[12].

Nursing students face not only academic stress but stress at work during their training period. One focus of interest in research on stress at work is the sources of stress, or stressors, which interact and contribute to the onset of stress in organizational settings (Spielberg & Reheiser) 2005[13].

People who exercise regularly will tell you they feel better. Some will say it's because chemicals called neurotransmitters, which are produced in the brain, are stimulated during exercise. Since it's believed that neurotransmitters mediate people's moods and emotions, they can make you feel better and less stressed[14].

Calisthenics are exercises that rely solely on body weight for resistance that can be performed anywhere. No gym, no cash, no

problem. Calisthenics are a great way to build muscle and improve your mood, all without stepping foot in a gym[15].

Callisthenics are aerobic and dynamic exercises. They are rhythmic, smooth, enjoyable exercises that are easy to perform alone or in a group format, and can be modified according to subject's fitness levels. A popular calisthenics is the jumping jack; it also works towards heart health and stress relief[16].

Calisthenics derived from the Greek kalos, meaning beauty, and sthenos, meaning strength, calisthenics don't necessarily require any exercise equipment. Calisthenics can act as a self-confidence and self-esteem booster[17].

Calisthenic exercises are intended to increase body strength and flexibility with movements using only one's body weight for resistance. The benefit both muscular, cardio vascular fitness and also improves psychomotor skill. Calisthenic exercises leads to an improvement in overall strength and energy to the body, in turn promoting overall health. These exercises have been known to improve mental health, which in turn helps in treating depression, stress, anxiety and the like. Calisthenic workout can help burn unwanted fat in the body, thus providing a fit physique[18].

Exercises produce neurotransmitters called endorphins in the brain, these are the body's own natural tranquilizers, and endorphins can make one feel calm and relaxed during and for up to three hours after moderate physical activity. Exercise can cause many people who are physically active to give up unhealthy and stressful habits that interfere with exercises, smokers may cut down/quit because smoking hinders aerobic performance, and others may eat more nutritiously to improve performance[19].

1.1 NEED FOR THE STUDY

The World Health Organization (WHO) has estimated that stress-related disorders will be one of the leading causes of disability by the year 2020[20].Nursing schools are now recognized as a stressful environment that often exerts a negative effect on the academic performance and psychological well-being of the students[21] Studies from the United Kingdom and India have reported increasing levels of stress among nursing students.[22, 23]

A study was conducted in Brazil on 1st, 2nd, & 3rd year B.Sc nursing students to assess depression among students associated with their self esteem. There were 224 subjects included based on the data obtained. The study adopted a descriptive qualitative approach using psychometric resources, which includes tests, inventories, questionnaires and scales. The findings of the study concluded, highlighting 1 case of serious depression, 14 moderate depressions, 28 mild depression and 181 without signs of depression[24].

A cross-sectional research was designed and 2013 nursing students in a public higher education institute were recruited. The Stressors in Nursing Students Scale-Chinese Version (SINS-CN) was used to measure nursing students stress. Data analysis includes descriptive analysis and analysis of variance. The overall SINS-CN mean score was 3.33 (SD = 0.49), while the scores for different dimensions were: clinical, 3.44 (SD = 0.54), education, 3.35 (SD = 0.62), finance and time, 3.31 (SD = 0.72), confidence, 3.21 (SD = 0.60), and personal problems, 3.03 (SD = 0.68). Among 10 most common stressors, four belong to the clinical dimension, four to the education dimension, one to the confidence dimension, and one to the finance & time dimension. Analysis for factors associated with stress indicated that no statistical significance was found in most demographic variables, except year two students stress scores were significantly lower

than those of students in other years (*p* values were between 0.000 and 0.026)[25].

The present descriptive cross-sectional study was conducted at College of Nursing, Maharishi Markandeshwar University, Mullana (Ambala) in the month of August 2011 using pretested self-administered questionnaire. Out of a total 400 students, 282 completed and returned the questionnaires, giving an overall response rate of 70.5%. One hundred and fourteen (40.4%) of the respondents were males, while 168 (59.6%) were females. The mean age of study subjects was 19.12 years, with a standard deviation of 1.5. The mean perceived stress score of all 282 students was 28.67 (SD = 5.32), with a median of 26 (IQR = 22-34). Female students significantly had more perceived stress score (31.33) than male students (26.01). The maximum mean PSS (29.66) was observed in the 2nd year students, and the least mean PSS (26.28) was found in the 3rd year students[26].

A descriptive study completed to assess the level of stress among under graduate nursing students in selected college at Chidambaram, TamilNadu.181 nursing students were selected, the study results showed that overall stress level among nursing students were under mild stress (27.6%), moderate stress (69.6%), and high stress (28%) also the level of stress was significantly P (<0.05) influenced by the choice in selection of course among nursing students[27.]

A study was conducted to know the effects of high intensity calisthenic exercises on pain, disability, psychological strain and serum cortisol concentration in people with chronic back pain, 20 subjects were randomly allocated into exercise and control group. Subjects in exercise group received a 12 week exercise program, while control group received 12 weeks of passive modalities. The findings of data analysis identified reduction in pain (41%, t10=8.51, P<.001), disability (31%, t10=7.32, P<.001) and psychological strain (35%, t10=7.09, P<.001) in subjects in exercise group and no changes in control group.

The study concluded that regular calisthenics would reduce pain, disability and psychological strain[28].

Based on the above reviews it confirmed that the under graduate nursing students are experienced a stress in their academic year in the same way calisthenic exercises improve the mood status of the individual. So the investigator felt that to conduct a study to reduce stress among nursing students by calisthenic exercises.

1.2 STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai"

1.3 OBJECTIVES OF THE STUDY

- To assess the existing level of stress among nursing students before calisthenic exercises intervention.
- To evaluate the post test level of stress among nursing students after calisthenic exercises intervention.
- To determine the effectiveness of calisthenic exercises on stress among nursing students.
- To find out the association between the level of stress in nursing students with their selected demographic variables.

1.4 OPERATIONAL DEFINITIONS

Assess:

It refers to the evaluation of the existing level of stress among nursing students.

Effectiveness:

It refers to the significant reduction in the level of stress after regular performance of calisthenic exercises among nursing students.

Calisthenic Exercises:

It refers to a form of aerobic and dynamic exercises consisting of a variety of simple, often rhythmical movements were jumping jacks, neck roll, free hand neck resistance, arm circle, trunk twist, alternating

toe touch with bar and standing one leg toe raised applied on selected group of nursing students for stress management.

Stress:

It refers to the score obtained on psychological distress are academic and clinically, physical distress are head ache, malaise and sleep experienced by the students that demands exceed their personal and social resources the individual is able to mobilize.

Nursing Students:

In this nursing student refers to those who are undergoing four years in baccalaureate nursing programme as per the Indian Nursing Council regulations in selected college of nursing.

1.5 HYPOTHESIS

H1: There will be significant difference between pretest and posttest scores of students in reduction of stress through calisthenics exercise.

H2: There will be significant association between the post levels of stress among nursing students with their selected demographic variables.

1.6 ASSUMPTIONS

- The nursing student may have mild, moderate or high levels of academic stress.
- Stress level may vary from individual to individual.
- Calisthenic exercises on stress management will help nursing students to cope better with their day today life stressors.
- The reduction in stress among the nursing students may show effective practical and preventive measures.

1.7 DELIMITATIONS OF THE STUDY

- The setting of the study (selected college of nursing) is limited to the study.
- The sample size is limited to 60 subjects.
- The period of data collection is limited to 4 weeks.

CHAPTER II

REVIEW OF LITERATURE

This chapter explains in detail about the review of literature and conceptual framework used for the study. Review of literature is an extensive, exhaustive and systematic examination of publications relevant to research project. One of the most satisfying aspects of the literature review is the contribution it makes to the new knowledge, insight and general scholarship of the researchers.

Review of literature serves as the key step in research process. It helps in many ways starting from selection and formulation of problem, providing conceptual framework for the study, assess feasibility, providing methodology for comparison and replication, avoiding obstacles and making generalization.

The review of literature pertaining to the present study is aimed at assessing the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai.

This chapter consists of two parts

Part I 2.1 Literature related study

Part II 2.2 Conceptual framework

2.1 ***The Review Of Literature Consists Of The Following Sections:***

2.1.1. Review of literature related to stress.

2.1.2. Review of literature related to calisthenic exercises.

2.1.3. Review of literature related to effectiveness of calisthenic exercises on stress.

2.1.1. REVIEW OF LITERATURE RELATED TO STRESS

Studies indicate that nursing students may be more prone to stress than other students.

Kalavani S, Dr.D. Karaline, Karunagari et al (2018) A Descriptive Cross Sectional study was carried out in the year 2015 among 181 nursing students in a selected college at Chidambaram taluk, Tamil Nadu. Data were collected by using demographic profile and

Modified Perceived Stress Scale (PSS) to assess the stress level of the participants. Descriptive and inferential statistics were used to analyze the data. The findings revealed that the overall stress level among nursing students, were under mild stress (27.6%), moderate stress (69.6%) and high stress (2.8%) also the level of stress was significantly ($p<0.05$) influenced by the choice in selection of course among nursing students. From this study, the researcher highlights that an effective intervention strategies have to be taught to the B.Sc. nursing students to relieve stress during their training period to promote stress free life[26].

Seyed fatemi, Naiemeh, Tafreshi (2017) was conducted in 1991 to investigate the perception level and sources of stress across academic years among B.Sc nursing students, 94 students were recruited for the purpose. The findings of the study revealed that psychiatric problems were more prevalent in nursing students than the general population. Many items ranked as stressful among nursing students were also identified in general population. In addition, the study concluded that nursing students had the feelings of inadequacy, difficulty in relationship with faculty, were given multiple assignments, have to devote long hours to study and lacked free time, timely feedback and faculty response to student's needs[29].

Agarwal B, chowdhry M, Mullerpatan R, (2014) was conducted a study to assess the short term movement therapy on levels of academic stress in 50 final year female students of physiotherapy. They were divided in group I group II. The result revealed that the group I score was 124.8 and group II score was 124.12 in before administration of movement therapy. One month later the score of group I 89.60 and group II score 129.40, there after one month the same test was conducted score of group I 119.04, group II 126.44. The study result shows that group I statistically significant reduction comparing to group II maintained a fairly constant score the study concluded with movement therapy helped to reduce the stress level in students[30].

Gibbons C, Dempster M, Montroy M (2014) a study was conducted at Saudi to determine rates and severity of depression, anxiety and stress among adolescent boys. The study recruited 1,723 male students out of which 59.4% had at least one of the three disorders, 40.7%had at least two and 22.6% had all the three disorders. Moreover >1/3rd of the participants (38.2%) had depression, while 48.9% had anxiety and 35.5% had stress. Further conclusion of the study was made that depression, anxiety and stress were strongly, positively and significantly correlated[31].

Omigbodun O. (2014) conducted study in Hong Kong to assess stress and burn out among nursing students. The study recruited 158 students, 37 males and 121 females between the age of 18-26 which employed a cohort design using self administered questionnaires and Maslach burn out inventory. The results of the study revealed that students suffered greater levels of stress, and this was explained by emotion - oriented coping. The study concluded that undertaking a nursing program leads to increased levels of stress, burn out and psychological morbidity and is largely related to individual personality and coping traits[32].

Brobeck E, Marklund B, Haraldson K, et al (2013) conducted study on specific stressors in children, for which 23 children age group between 8 – 12 years were recruited for the study. The findings of the study revealed 6 boys and 7 girls with stress related symptoms, further comparison was made between the sex, the study concluded that majority of girls were found to have more stress than boys. In the study more girls (41.2%) than boys (16.2%) rated their stressor as "it upset me a lot"[33].

Jones MC, Johnson DW (2012) Researchers and social commentators have pointed out that economic factors that the employees are facing in the 21st century have been linked to increased levels of stress. There has been a great deal of research in to what makes

nursing stressful. Two Canadian studies in 1999 and 2001 showed approximately 37% of Canadian nurses fell within Karasek's high stress job category[34].

Boyce W.T(2011) conducted study was at U.S.A to found the mean score for current state of health amongst nurses was not significantly different from any other occupational group, but nurses had the highest mean number of self reported sickness and absenteeism. The study concluded that of all occupational groups compared with doctors, nurses have been found to score high in stress[35].

Jones MC, Johnson DW (2011) conducted study was to found that short term sick leaves were associated with the combination of high demands and low decision latitude(high strain jobs) and low social support at work. Staff nurses who had high strain jobs felt significantly less empowered, less committed and less job satisfaction than nurses who reported less job strain[36].

Peggy Blake Gleeson, Elizabeth J Protas (2011) conducted study was to determine the effects of stress, and reported that stress levels were significantly correlated with illness frequency (P=.001) and severity (P=.0001) and concluded that that stress is particularly important in illness because it has the potential to impair human functioning. Stressful life events put people at higher risk for depression, and life stressors play a significant role in precipitating 1st and 2nd episode of major depression[37].

2.1.2. REVIEW OF LITERATURE RELATED TO CALISTHENIC EXERCISES:

Taspinar O, Aydin T, et al (2015) was carried out the study to evaluate the effects of calisthenic exercises on psychological status in patients with ankylosing spondylitis and multiple sclerosis.In this study comprised 40 patients diagnosed with AS randomized into two exercise groups (group 1 = hospital-based, group 2 = home-based) and 40 patients diagnosed with MS randomized into two exercise groups

(group 1 = hospital-based, group 2 = home-based). The study results confirmed that the exercise programme was completed by 73 participants (hospital-based = 34, home-based = 39). Mean age was 33.75 ± 5.77 years. After the 8-week exercise programme in the AS group, the home-based exercise group showed significant improvements in erythrocyte sedimentation rates. The hospital-based exercise group showed significant improvements in terms of the Bath AS Metrology Index and Hospital Anxiety and Depression Scale-Anxiety scores. This study concluded the positive effects of calisthenic exercises on neurologic and rheumatic chronic inflammatory processes associated with disability should not be underestimated[38].

Chennamma D. Chilamur and N. Chandrappa (2015) investigated physical education is that phase of education which is concerned, first, with the organization and leadership of children in big-muscle activities to gain the development and adjustment inherent in the activities according to social standards and second, with the control of health or growth, continues naturally, associated with the leadership of the activities so that the educational process may go on without growth handicaps. Physical education should aim to improve the mass of students and to give them as much health strength and stamina as possible them to perform the duties that awards them after they leave the college[39].

El-Sobkey, Salwa. (2015) conducted study was in Saudi to explore calisthenic exercises induced changes in myocardial oxygen consumption in normotensive healthy subjects. The study recruited 11 female college students. They performed upper and lower extremity one minute calisthenic exercises. This resulted in increased post-exercise RPP (Rate pressure Product) estimating increase in MVO2 demand, this increase influenced by the three selected exercise cadences (P=0.029 for upper extremity and 0.0001 for lower extremity). The study concluded

that more MVO2 is required with lower extremity calisthenics than upper extremity calisthenics[40].

Aldwin C.M, and Revenson T.A (2011) conducted study was to review 101 reports of exercise training in heart failure patients and selected 9 trials for combined analysis. It included subjects with left ventricular ejection fractions less than 50%. They used exercise as the only intervention for at least 12 weeks, and obtained survival rate up for > 3 months after exercise training. The study concluded that this information provided on 395 exercise trained and 406 control patients, both mortality (-35%, 95% CI, -8 to -54) and the combined end patient's death or hospital admission (-28%, -95%CI, -7 to -46) were significantly reduced in exercise-trained subjects[41].

Peggy Blake Gleeson, Elizabeth J Protas (2011) conducted study was in Texas to compare the oxygen consumption (VO2) during calisthenic in middle – aged women (aged 43- 63 years) with and without coronary artery disease. Indirect caloriemetry was used to measure VO2 in 15 healthy women and 15 women with CAD, 4 exercises were performed for 3 minutes. Oxygen consumption was lowest for both the groups during knee extension and trunk flexion. Further the study concluded that both the groups demonstrated highest levels of VO2 during hip flexion exercise[42].

Asent, S.M,Landers, D.M. and Etnier, J.L (2010) conducted study was in Washington to determine whether regular calisthenic exercise is associated with decreased risk for dementia and Alzheimer disease. A prospective cohort study recruited 1740 persons older than 65 years without cognitive impairment who scored above 25th percentile on cognitive ability screening instrument (CASI). During a mean follow up of 6.2 years (SD, 2.0), 158 participants developed dementia (107 developed Alzheimer disease). The incidence rate of dementia was 13.0/1000 person –years for participants who exercised 3 or more times per week compared with 19.7/1000 person –years for those who

exercised less than 3 times per week. The study concluded that regular exercise is associated with a delay in onset of dementia and Alzheimer disease[43].

Dr Jaykishan Santhosi (2010) conducted a study was in India (nagpur) to find out the effects of calisthenics and yoga exercises on selected physical and physiological variables. The study was conducted on a total of 120 randomly selected male students between the ages of 18-22 years. They were divided into 4 groups - group1, group2, group3 and group4 as only calisthenic group, only yogasana group, combined group and control group respectively. The experimental group were given exercises for 1hour daily for 6 weeks for a period of 12 weeks. The study concluded that from the intra group comparison physical and physiological fitness is improved by the training of all calisthenic exercises selected and from inter group comparison, combined calisthenic and yoga both are best for improving physical and physiological fitness[44].

Rasen J Bridgewater, M Margie H Sharpe (2010) conducted study was in Australia to assess the effectiveness of calisthenic exercises in early Parkinson disease. The effects of 12 weeks of twice weekly exercise were investigated in a group of 13 persons with Parkinson disease. They were compared with 13 non exercising parkinsonians. Exercise participation increased cardio pulmonary fitness and habitual activity level and marginally improved mood. Functional ability remained stable in exercise group, but decreased in control group. No change was noted in parkinsonian signs. The study concluded that exercises promote cardio pulmonary function, activity level, and mental functioning[45].

Shih-Chueh Chen, MD, PhD**, Kwo-Chang Ueng (2010)** validate the effects of a simplified, gentle form of *t'ai chi chuan* in patients with type 2 diabetes and obese. Study subjects were hospital-based patients with type 2 diabetes and who were also obese (ages 40–

70, with a body–mass index [BMI] range of 30–35). The patients were randomly selected and grouped into *t'ai chi* exercise (TCE) and conventional exercise (CE) groups. After receiving instruction in *t'ai chi*, the TCE group and the CE group practiced three times per week, including one practice session lasting up to 1 hour, for 12 weeks. After 12 weeks, hemoglobin A1C values of the TCE group did not decrease ($8.9 \pm 2.7\%$: $8.3 \pm 2.2\%$; $p = 0.064$). BMI (33.5 ± 4.8 : 31.3 ± 4.2; $p = 0.038$) and serum lipids, including triglyceride (214 ± 47 mg/dL : 171 ± 34 mg/dL; $p = 0.012$) and high density lipoprotein cholesterol (38 ± 16 mg/dL : 45 ± 18 mg/dL; $p = 0.023$) had significant improvements. Serum malondialdehyde tended to decrease from baseline (2.66 ± 0.78 μmol/L : 2.31 ± 0.55 μmol/L; $p = 0.035$), and C-reactive protein also decreased (0.39 ± 0.19 mg/dL : 0.22 ± 0.15 mg/dL; $p = 0.014$). No improvements occurred in BMI, lipids, and oxidative stress profiles in the CE group[46].

Jenkins,C.D (2009) conducted study was in New orleans to evaluate the impact of exercise training on mortality of 53 patients with CAD's with high levels of psychosocial stress (PSS), and in 469 patients with low levels of psychosocial stress(LPSS).And compared them with 27 control patients with high PSS , who did not undergo formal exercise training. The study concluded that mortality was approximately 4 fold greater in patients with high PSS, than those with LPSS (22% VS 5%; P_.003) exercise training decreased the prevalence of PSS from 10% - 4% (P_.0001) and similarly improved peak oxygen with high and low PSS[47].

2.1.3. REVIEW OF LITERATURE RELATED TO EFFECTIVENESS OF CALISTHENIC EXERCISES ON STRESS.

"Finding way to reduce stress can not only make one happier and healthier, it can help you live a longer and more productive life"

Akpan S, John, Edet B, Ella E (2017) conducted a descriptive cross sectional study to assess stress and coping strategies among

graduate nursing students in Nigeria by using simple random sampling technique and sample size 154.stress level assessed by structured questionnaire of PSS. The results also revealed that out of the 154 respondents 73% had low level stress and 81% had high level of stress. The investigator concluded half of respondents suffered from high level of stress[48].

Evangelista AL, Evangelista RAGT, et al (2017) completed Effects of High Intensity Calisthenic Training on Mood and Affective Responses. The purpose of this study was to analyze affective and humor responses to high-intensity (HIIT) body work (calisthenic) training. Twenty-six healthy adult men who were recreationally active underwent an acute single session of HIIT body work training.Based on 8 sets of 20 sec of all-out supramaximal intensity and 10 sec of passive recovery period. The exercises used were the burpee, jumping jack, mountain climber, and squat and thrust. The subjects responded to the Profile of Mood States (POMS) and a feeling scale before and after the session. mood states before and after the HIIT whole body protocol. Fatigue (P = 0.03, ES = 0.48) was higher at the end of the session. The effect size showed a small magnitude of reduction in anger (ES = 0.27) and depression (ES = 0.24) as well as in tension (ES = 0.18), confusion (ES = 0.14), and vigor (ES = 0.13)[49].

Dake C (2016) conducted in Saudi to explore calisthenic exercises induced changes in myocardial oxygen consumption in normo tensive healthy subjects. The study recruited 11 female college students. They performed upper and lower extremity one minute calisthenic exercises. This resulted in increased post-exercise RPP (Rate pressure Product) estimating increase in MVO2 demand, this increase influenced by the three selected exercise cadences (P=0.029 for upper extremity and 0.0001 for lower extremity). The study concluded that more MVO2 is required with lower extremity calisthenics than upper extremity calisthenics[50].

Valarmathi V, Tamil Selvaarasan and A. Judie (2016) Conducted study was to determine the effectiveness of aerobic dance movement therapy on academic stress among adolescents selected school at Kancheepuram district, Tamilnadu. Quasi experimental non equalent pre-test, post-test control group design was used. There are 268 students screened by the academic stress scale was developed by Dr.BalajiRao (2013) out of which 170 adolescents who had slightly stress, and moderate stress were selected 88 in study group and 82 in control group and the intervention was given for one month followed by the post test was conducted. The analysis revealed that comparison of post test of study and control group mean and SD value of adolescents academic stress was found to be statistically highly significant with t= 6.14 at $p<0.0001$**[51].

C,Jefferson C,Roehrs T, et al (2015) conducted study to review 101 reports of exercise training in heart failure patients and selected 9 trials for combined analysis. It included subjects with left ventricular ejection fractions less than 50%. They used exercise as the only intervention for at least 12 weeks, and obtained survival rate up for > 3 months after exercise training. The study concluded that this information provided on 395 exercise trained and 406 control patients, both mortality (-35%, 95% CI, -8 to -54) and the combined end patient's death or hospital admission (-28%, -95%CI, -7 to -46) were significantly reduced in exercise-trained subjects[52].

Rasen.J Bridgewater,Mmargie H Sharpe (2015) A study was conducted in Australia in 2010 to assess the effectiveness of calisthenic exercises in early Parkinson disease. The effect of 12 weeks of twice weekly exercise was investigated in a group of 13 persons with Parkinson disease. They were compared with 13 non exercising parkinsonians. Exercise participation increased cardio pulmonary fitness and habitual activity level and marginally improved mood. Functional ability remained stable in exercise group, but decreased in control group.

No change was noted in parkinsonian signs. The study concluded that exercises promote cardio pulmonary function, activity level, and mental functioning[53].

Stephan Gielen, Volker Adams, Sven Möbius-Winkler (2013) assesses the effects of regular physical exercise on local inflammatory parameters in the skeletal muscle of patients with chronic heart failure. 20 male patients with stable chronic heart failure (left ventricular ejection fraction 25 ± 2%; age 54 ± 2 years) were randomized to a training group (n = 10) or a control group (n = 10). At baseline and after six months, serum samples and vastus lateralis muscle biopsies were obtained. Serum tumor necrosis factor (TNF)-alpha, interleukin (IL)-6, and IL-1-beta levels were measured by enzyme-linked immunosorbent assay, local cytokine, and iNOS expression by real-time polymerase chain reaction. Exercise training significantly reduced the local expression of TNF-alpha, IL-1-beta, IL-6, and iNOS in the skeletal muscle of chronic heart failure patients. These local anti-inflammatory effects of exercise may attenuate the catabolic wasting process associated with the progression of chronic heart failure [54].

Armstrong RB (2009) conducted A study was in Greece on patients with low back pain, 20 subjects were recruited over a period of 8 months. The subjects were randomly assigned to exercise and control groups. The exercise group followed a 12 week of calisthenic exercise programme, whereas the control group received 12 week of passive modalities without any exercises. The outcome measures of both the groups are as follows; Effect size values (ESV) for exercise group were 2.34 for pain, 1.68 for disability, 2.01 for psychological strain and 0.06 for cortisol concentration. ESV for control group was 0.03, 0.03, 0.16 and 0.32 respectively. The study concluded that calisthenic exercise would decrease pain, disability and psychological strain[55].

Murrow L JL, Lopez AD (2009) conducted study was in 2009 on effects of calisthenic exercise training on high risk behaviours. In

which indices of hostility, depression and overall psychosocial stress were decreased by 50 – 70%. Data from a recent randomized trial demonstrated that exercise training can decrease depressive symptoms as effectively as antidepressants. Stress has been linked to the onset of Illness and plays an etiological role in the disease process. It can worsen pain symptom and make the burden of disease harder to bear as well[56].

Richard V. Milani, Carl J. Lavie, (2009) examined that Reducing Psychosocial Stress: A Novel Mechanism of Improving Survival from Exercise Training. We evaluated the impact of exercise training during cardiac rehabilitation on mortality in 53 patients with coronary artery disease with high levels of psychosocial stress and in 469 patients with coronary artery disease with low levels of psychosocial stress and compared them with 27 control patients with high psychosocial stress who did not undergo formal cardiac rehabilitation and exercise training. It reveals that mortality was approximately 4-fold greater in patients with high psychosocial stress than in those with low psychosocial stress (22% vs 5%; P = .003). Exercise training decreased the prevalence of psychosocial stress from 10% to 4% (P < .0001) and similarly improved peak oxygen uptake in patients with high and low psychosocial stress[57].

Dimitris chatzitheodorou, Chris kabitsis, Paraskevi Malliou. (2007) conducted study was to know the effects of high intensity calisthenic exercises on pain, disability, psychological strain and serum cortisol concentration in people with chronic back pain, 20 subjects were randomly allocated into exercise and control group. Subjects in exercise group received a 12 week exercise program, while control group received 12 weeks of passive modalities. The findings of data analysis identified reduction in pain (41%, t10=8.51, P<.001), disability (31%, t10=7.32, P<.001) and psychological strain (35%, t10=7.09, P<.001) in subjects in exercise group and no changes in control group.

The study concluded that regular calisthenics would reduce pain, disability and psychological strain[58].

Eric B. Larson, MD, MPH; Li Wang, MS; James (2006) suggest that people with high levels of physical activity are less likely to develop dementia. All 1740 participants in this cohort study were 65 years of age or older and were cognitively intact at baseline. Over 6.2 years, the rate of dementia was 13.0 per 1000 person-years in those who exercised 3 or more times per week and 19.7 per 1000 person-years in those who exercised less than 3 times per week. It evidence that regular exercise is associated with a lower risk for dementia. However, the existing evidence does not prove that regular exercise is associated with a lower dementia risk[59].

Roehrs T, et al (2005) conducted study in Italy to evaluate the effectiveness of calisthenic exercises and their correlation between aerobic capacities, pulmonary functions and cognition. The study devised an aerobic exercise program consisting of submaximal level of calisthenics for relatively healthy women between 60 – 80 years. The calisthenics were performed for 4 months, 3days/week, 40 - 50minutes/day. Further the results revealed significant improvements in aerobic capacity, pulmonary and cognitive functions after 4 months. The study concluded that overall subjects expressed their happiness and well being on every occasion, during and after exercise program[60].

2.2: CONCEPTUAL FRAMEWORK

The conceptual framework selected for the study is based on Kenny's Open System Model. All the living system is open, in this there is continuous exchange of matter, energy and information. Open system has changing degree of interaction with the environment from which the system receives input and gives back output in the form of matter, energy and information.

The main concept of open system model is input, throughput, output and feedback. The study is undertaken to determine the effect of calisthenic exercises on stress among nursing students.

INPUT

Input can be matter, energy and information from the environment. In this present study the environment refers to college of nursing and refers to the collection of demographic variables from the samples such as age, religion, basic educational status, year of study, occupation of parents, monthly income, medium of the instruction in higher secondary education, percentage of marks obtained in higher secondary, types of family, residence, any problems in the family, average study time per day, leisure time activities carried out in a day and pre test level of stress among nursing students assessed by structured questionnaire of perceived stress scale.

THROUGHPUT

The matter, energy and information are continuously processed throughput the system which is also called complex transformation known as throughput process is used for input. In this present study the throughput refers to calisthenic exercises on stress reduction among nursing students who are regularly practicing calisthenics exercises with 30 minutes duration; those are jumping jacks, neck rolls, free hand neck resistance, arm circles, alternating toe touches with bar, trunk twists, abductor/adductor leg raise, prone leg extension, standing one legged toe raise.

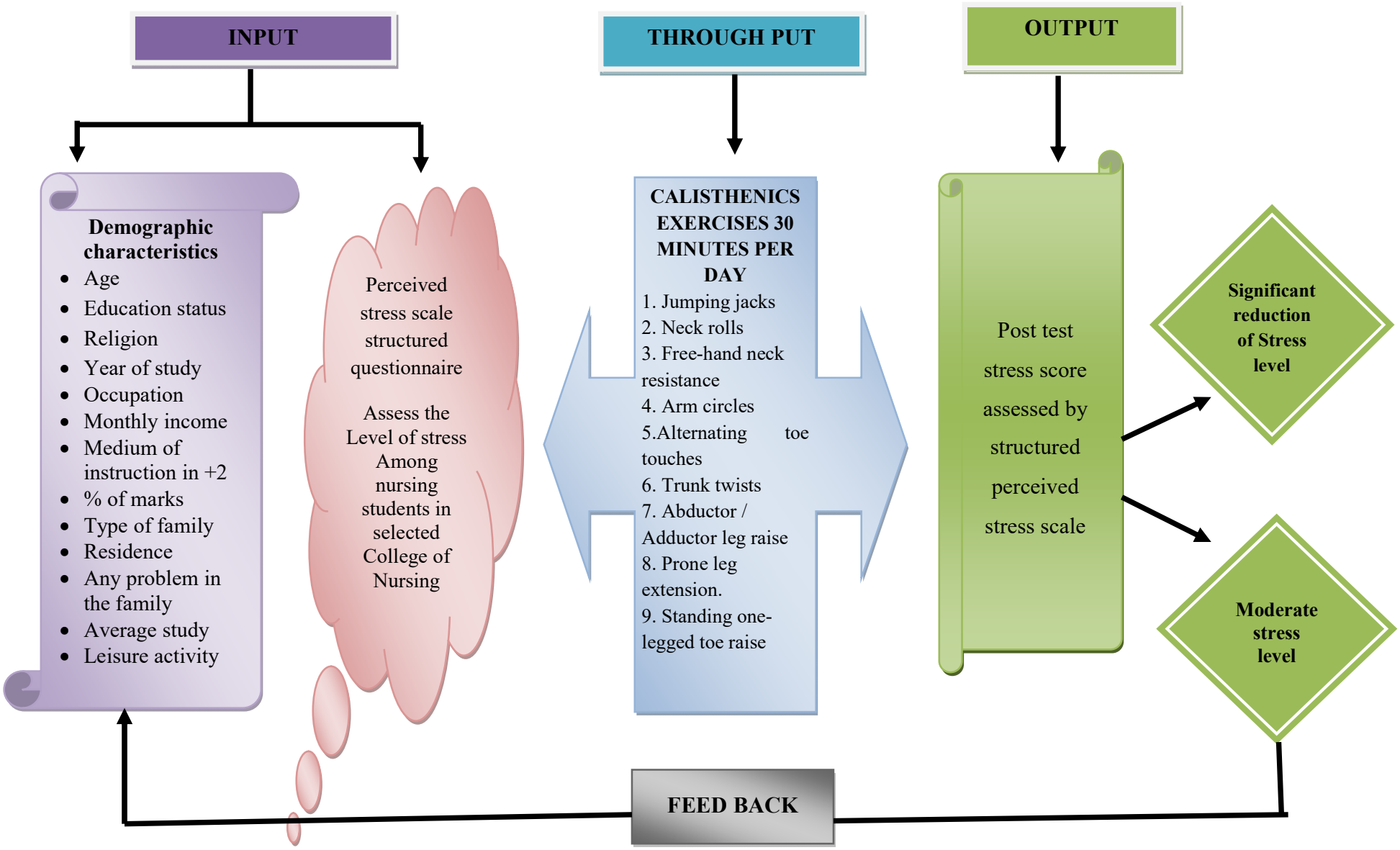
OUTPUT

After processing the input and throughput, the system returns to the output matter, energy and information in an altered state. In the present study significant changes happened in the level of stress of the samples.

FEEDBACK

Feedback gives information about environment response to the system. Output is utilized by the system in adjustment, correction and accommodation to the interaction with the environment. In the present study, effectiveness of calisthenics exercise is considered in calculating mean percentage and testing hypothesis. If moderate level of stress occurs for students during feedback inform the samples to continue the intervention.

FIGURE: 1 –MODIFIED CONCEPTUAL FRAMEWORK BASED ON J.W.KENNY, S OPEN SYSTEM MODEL



CHAPTER -III

METHODOLOGY

This chapter consists of the research approach, research design, variables in the study, setting of the study, and the population, sample, sample size, sampling technique, selection criteria, development and description of tool, content validity, pilot study, reliability, data collection procedure and plan for data analysis.

3.1. RESEARCH APPROACH

The research approach is the most essential part of any research. The entire study is based on it. The research approach used in the study is applied form of research to find out a well programme, treatment, practice or policy as effective as possible. In this study effectiveness of calisthenic exercise in reducing stress among the nursing students was evaluated. Therefore a quantitative evaluation approach was essential to test the effectiveness of interventions.

Data collection period: The study was conducted for four weeks from to 02-01-2018 to 29 -01-2018.

3.2. RESEARCH DESIGN

The investigator has selected the pre-experimental design as suitable method for study (one group pre-test, post test).There was a manipulation for the subjects without a control group and randomization.

Table.1 Shows Research design

S. No	Group	Pre-Test	Intervention	Post-Test
1	Stress among the nursing students in College of Nursing	O_1	X	O_2

Key

O1 Pre test to assess the level of stress among the nursing students by perceived stress scale.

X Calisthenic exercises (30 minutes per day)

O2 Post test to assess the level of stress among the nursing students by perceived stress scale.

3.3 VARIABLES IN THE STUDY

Variables: A variable is a characteristic, which can be taken on different values. The categories of variables discussed in the present study were

Independent Variable: Calisthenic exercises for management of stress among nursing students.

Dependent variable: Level of stress among nursing students

Extraneous variables: Demographic variables such as age, religion, education, socio- economic status, personal habits, methods of recreation, rest and sleep.

3.4 SETTING OF THE STUDY

According to Polit and Hunger (1997), setting refers to the physical location and condition in which data collection takes place in the study. The setting was selected based on acquaintance of the investigator with the institution, feasibility of conducting the study, availability of the sample, Permission and proximity of the setting to investigation

The study was conducted to nursing students residing at Nurses Home, Rajiv Gandhi Government General Hospital, Chennai.3.

3.5 POPULATION

Target population: was the aggregate of cases about whom the researcher would like to make generalization. The nursing students residing in nurses home are target population.

Accessible population: is the aggregate of cases that conform to the designed criteria and which is accessible to the researcher.

Baccalaureate nursing students residing in nurses home were the accessible population for this study.

3.6 SAMPLE

All the Baccalaureate nursing students were included in the study and those who fulfilled the sampling criteria.

3.7 SAMPLE SIZE

The sample size was 60.

3.8 SAMPLING TECHNIQUE

Convenient Sampling technique will be used to select the 60 samples of nursing students residing in Nurses Home, RGGGH, Chennai.

3.9 SAMPLING CRITERIA

The study sample was selected by the following inclusion and exclusion criteria.

Inclusion criteria:

- Those who are studying in Baccalaureate nursing programme.
- Those who are available and willing to participate in this study.

Exclusion criteria:

- Those who have already undergone calisthenic exercise programme.
- Those who are having orthopaedic related problems.
- Those who are having any systemic illness.

3.10 DEVELOPMENT AND DESCRIPTION OF THE TOOL

- The tool used for the study was **perceived stress scale.**
- The technique used for the study was structured questionnaire method.

Tools: The instrument selected in research should be as far as possible the vehicle that obtains the best data for drawing conclusions to the study. ***The study consists of the following tools:***

Development of Tool:

Tool was selected after extensive literature review from the various text book, internet search, guidance and discussion with experts in the field of nursing, psychiatry and statistics. A structured questionnaire was used to collect data from the female Baccalaureate nursing students who were residing in Nurses Home, RGGGH, Chennai.

Section A: Consists of demographic variables such as age, sex, education, socio-economic status, personal habits, and methods of recreation, rest and sleep.

Section B: Students stress assessment by perceived stress scale will be used on nursing students.

3.11 DESCRIPTION OF THE INSTRUMENT

Section-I: There is no score allotted for baseline variables.

Section-II: Perceived stress scale which consists of 10 questions.

The investigator collected the data by questionnaire method. The items were assessed by the tool scores, the questions in the scale ask about your feelings and thoughts during the last month. The tool consists of 10 items in each case you will be asked to indicate how often you felt or thought a certain way. For each question choose from the following alternatives: 0-never, 1-almost never, 2- sometimes, 3-fairly often, 4-very often.

Determine the PSS score by following these directions:

First, reverse your scores for questions 4, 5, 7, & 8. On these 4 questions, change the scores like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0. Now add up your scores for each item to get a total. Individual scores on the PSS can range from 0 to 40.

Minimum score = 0 Maximum score =4 Questions= 10 Total score=40

Level of stress	Range of score
Low stress	0-13
Moderate stress	14-26
High perceived stress	27-40

3.12 RELIABILITY OF THE TOOL

The reliability of an instrument is the degree of consistency with which it measures the attribute and it is supposed to be measuring over a period of time. The tool was a standardized one. Reliability of the tool was assessed by using Test retest method. Stress score reliability correlation coefficient value is 0.82.Hence the tool was reliable and was used in this study.

Content Validity

Data collection tool is an instrument that measures the variables of interest of the study accurately, precisely and sensitively.

Content validity of the tool was obtained from experts in the field of psychiatric nursing, psychiatry, psychology and statistical expert. The experts were an associate professor, psychiatrist and clinical psychologist. The experts were requested to check the relevance, sequence and adequacy of the content. There was uniform agreement of the tool which is adopted to conduct the study. Hence, the investigator precedes the same tool.

3.13. ETHICAL CONSIDERATION

The study objectives, intervention, data collection procedure approved by the Institutional Ethics Committee of Madras Medical College, Chennai. The nursing students were explained about the purpose and need for the study. They were assured that their details and answers will be used only for the research purpose. Further they were ensured that their details will be kept confidentially. Thus the

investigator followed the ethical guidelines, which were issued by the Institutional Ethics Committee after getting a written permission.

3.14. PILOT STUDY

Pilot study is a trail run for the main study to test the reliability, practicability and feasibility of the study.

The main objectives of the pilot study are to help the researcher to become familiar with the use of tool and to find out the difficulties in the main study. The investigator underwent calisthenic exercises training programme from stipulated and popular fitness centre by a therapist and obtained a certificate. The pilot study was conducted after getting ethical clearance and the permission from the Dean, Madras Medical College, Chennai, Principal, College of Nursing, Madras Medical College, and Warden, Nurses Home, RGGGH Chennai. It was conducted for a period of one week. Sample of 10 nursing students was selected by convenient sampling technique. Informed consent was obtained from them before collection of the data.

Data were collected from the nursing students by structured questionnaire was perceived stress scale before the implementation of calisthenic exercise. After completion of calisthenic exercise sessions, the nursing students were assessed their stress by using same scale. Pilot study samples are excluded in the main study.

3.15. DATA COLLECTION PROCEDURE

The entire data collection procedure was spread out over a period of four weeks from 02-01-2018 to 29-01-2018 .There are 160 nursing students were residing in the age group from 17 to 22 years, irrespective of caste, creed and religion. Initially the investigator approaches each nursing students after getting permission from the Dean, Madras Medical College, Chennai, Principal, College of Nursing, Madras Medical College, and Warden, Nurses Home, RGGGH Chennai.

Investigator selected 72 nursing students initially. In which 3 of them were dropped due to acute illness like fever and cold, 3 of them

were unable to attend due to their physical inability and 6 were not willing to participate in the study. The investigator selected 60 nursing students as per the inclusion and exclusion criteria. The nursing students were introduced with the whole programme after an introduction and then a written informed consent was obtained from them for willingness to participate in the study. They were assured that their responses and details will be kept confidential and will be used only for the research purpose. Before the tool perceived stress scale was administered some informal discussion were made with participants to establish rapport so that they would be relaxed.

The total 60 nursing students were divided into two groups. Each group contained 30 nursing students. Every day the 30 participants were gathered around 5.30AM in the common hall in the Nurses Home. In the first two days pre test questionnaire was administered to them and they were asked to give appropriate answers for all statements to find out the level of stress by structured scale before calisthenics.

Following assessment three weeks of calisthenic exercise was administered after demonstration. The calisthenic exercise was administered to the group for half an hour in the morning and evening session. Each participant were assigned and supervised as well as corrected during the performance of calisthenic exercise for 19 days. Before starting calisthenic exercise attendance was taken by the researcher. Every day calisthenic exercise started in the morning session from 5.30 A.M 6.00 A.M and evening sessions from 5.30 P.M to 6.00 P.M. The researcher everyday supervised and encouraged the participants during calisthenic exercise. On the end of three weeks calisthenic exercise session the post-test was administered by Perceived stress Scale for assess the level of stress during the fourth week among the nursing students.

SCHEDULE OF DATA COLLECTION PROCEDURE

Day	Description of activity	Duration
1	Consent of all the participants, Pretest level of stress assessment and introduction, need , purpose & importance	45 mts
2	Exercise 1. Jumping jacks Exercise 2. Neck rolls	30 mts
4	Exercise 3. Free-hand neck resistance Exercise 4. Arm circles	30 mts
5	Exercise 5. Alternating toe touches, Exercise 6. Trunk twists	30 mts
6	Exercise 7. Abductor/adductor leg raise, Exercise 8. Prone leg extension	30 mts
7	Exercise 9. Standing one-legged toe raise	30 mts
8	Post test after 3 weeks of duration 4th week	45 mts

3.15.1. Intervention protocol:

Place	Nurses Home, RGGGH, Chennai**.**
Intervention	Calisthenic Exercises
Tool	Perceived stress scale
Duration	Four weeks
Frequency	Twice a day
Time	Morning 5.30 AM to 6.00 AM. Evening 5.30 PM to 6.00 PM.
Administered by	The Investigator
Recipient	Nursing students residing in Nurses Home, RGGGH, Chennai**.**

Procedure

Exercise 1. Jumping jacks

Exercise 2. Neck rolls

Exercise 3. Free-hand neck resistance

Exercise 4. Arm circles

Exercise 5. Alternating toe touches

Exercise 6. Trunk twists

Exercise 7. Abductor/adductor leg raise

Exercise 8. Prone leg extension

Exercise 9. Standing one-legged toe raise

3.16 PLAN FOR DATA ANALYSIS

The data analysis involved the use of statistical procedures to give an organization and meaning to the data. The collected data was analyzed by means of descriptive statistics, and inferential statistics. To compute the data, a data sheet was prepared by the investigator.

DESCRIPTIVE STATISTICS

- Analysis of the baseline data was done by using frequency and percentage.
- Stress among nursing students was analyzed by computing frequency, percentage, mean and Standard deviation.

INFERENTIAL STATISTICS

- **Paired "t" test** was used to find out the effectiveness of calisthenic exercises in reducing stress among nursing students.
- **Chi-square analysis** was used to determine the association between the level of stress and selected socio demographic variables among nursing students.

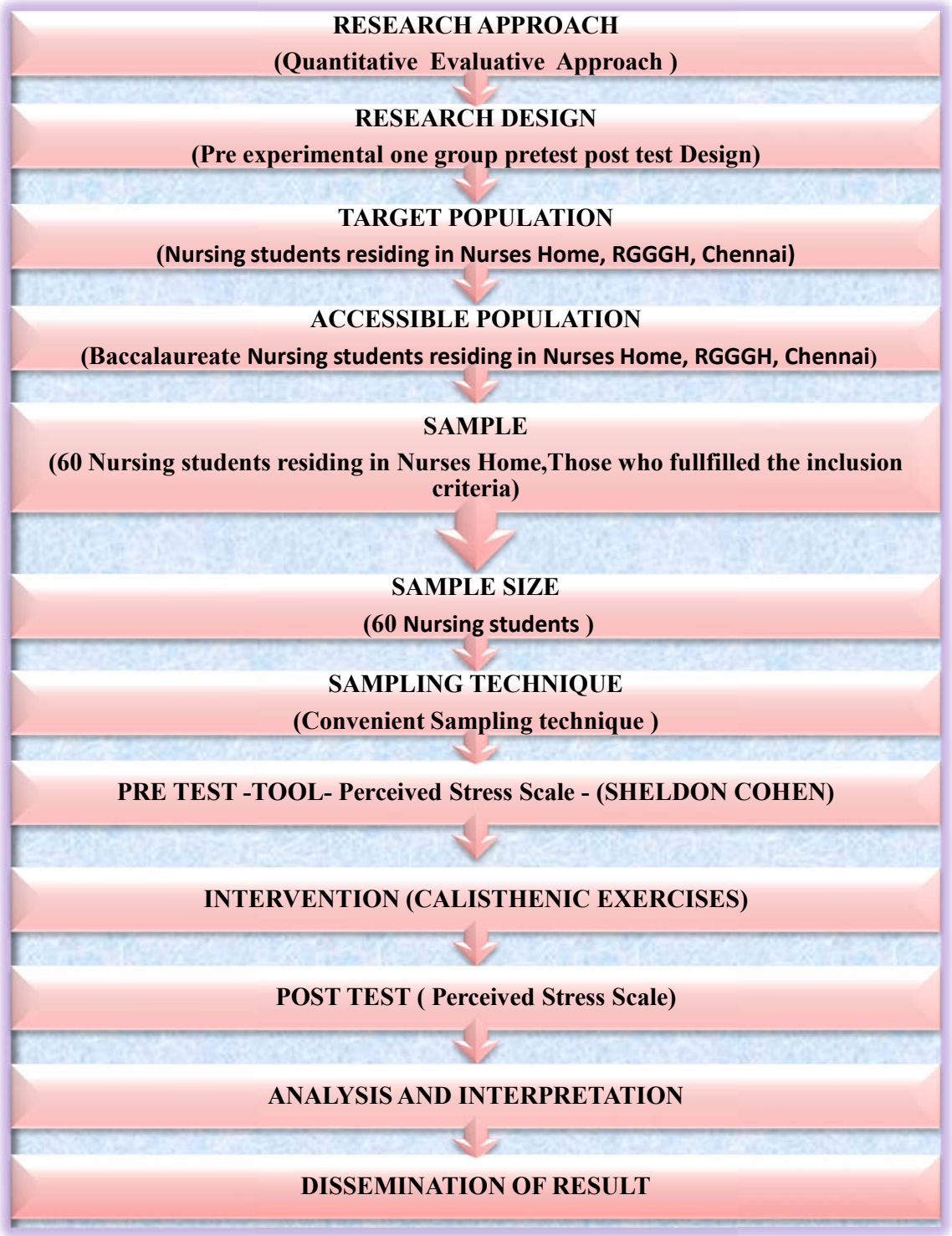


FIGURE: 2 SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the data obtained from 60 nursing students in selected college of nursing, Chennai. The collected data were tabulated and presented according to the objectives under the following orderly sections.

- **Section I**

  Distribution of nursing students' data according to the socio demographic variables

- **Section II**

  Pretest level of stress among nursing students before administration of calisthenic exercise

- **Section III**

  Posttest level of stress among nursing students after administration of calisthenic exercise

- **Section IV**

  Assess the effectiveness of calisthenic exercise on stress among nursing students

- **Section V**

  Association between the post test level of stress and selected demographic variables among nursing students

SECTION I

Table 4.1: Distribution of nursing students according to the socio demographic variables

Demographic information		No. of students	%
Age in years	17 -18 years	37	61.7%
	19 -20 years	23	38.3%
	21 -22 years	0	0.0%
Basic Education	+ 2	54	90.0%
	Graduate	6	10.0%
Religion	Hindu	54	90.0%
	Muslim	3	5.0%
	Christian	3	5.0%
Year of study	I Year	30	50.0%
	II Year	30	50.0%
Occupation of parents	Government	5	8.3%
	Private	13	21.7%
	Business	2	3.3%
	Others	40	66.7%
Family Monthly income	Below 10,000	24	40.0%
	Rs.10,000- 15,000	22	36.7%
	Rs.15,000- 20,000	8	13.3%
	>Rs. 20,000	6	10.0%
Medium of the instruction in higher secondary education	Tamil	40	66.7%
	English	20	33.3%
Percentage of marks obtained in higher secondary	70-80 percent	5	8.3%
	80-90 percent	13	21.7%
	Above 90	42	70.0%
Types of family	Nuclear	52	86.7%
	Joint	6	10.0%

	Extended	2	3.3%
Residence	Rural	40	66.7%
	Urban	14	23.3%
	Semi urban	6	10.0%
Any problems in the family	Nil	46	76.7%
	Financial problem	14	23.3%
	Others	0	0.0%
Average study time per day	< 1 hours	20	33.4%
	1-2 hours	29	48.3%
	>2 hours	11	18.3%
Leisure activities carried out in a day	Exercise	4	6.7%
	Gardening	0	0.0%
	Playing	7	11.7%
	Watching T.V	37	61.6%
	Others	12	20.0%

The above table 4.1 shows the demographic information of nursing students those who are participated for the following study on "A study to assess the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai"

Among 60 nursing students (61.7%) were 17 – 18 years of age group, (38.3%) were 19-20 years and none of them in the age group of 21 – 22 years.

According to basic education (90%) had +2, (10%) had graduate. In religion (90%) were Hindu, (5%) were Muslim, and (5%) were Christian.

The year of study (50%) were from I year, (50%) were from II year.

According to occupation of their parents (21.7%) were private job, (8.3%) were government job, (3.3%) were business and (66.7%) were other than the private, government and business.

In family monthly income (40%) of students family income was below 10,000, (36.7%) was Rs. 10,000-15,000, (13.3%) was Rs.15,000-20,000, (10%) was >Rs. 20,000.

Regarding medium of instruction in higher secondary education (66.7 %) were Tamil, (33.3%) were English.

In percentage of marks obtained in higher secondary (70%) were got above 90 percentage, (21.7%) were got 80-90 percentage, (8.3%) were got 70-80 percentage.

The type of family was (86.7%) were nuclear family, (10%) were joint family, (3.3%) were extended family.

Regarding residence (66.7%) was from rural, (23.3%) were from urban, (10%) were from semi urban.

Any problem in the family was (76.7%) didn't have any problem in their family, (23.3%) had financial problem.

Among nursing students average study time per day was (48.3%) were studying 1-2 hours, (33.4%) were studying less than 1 hour, and (18.3%) were studying more than 2 hours.

Regarding leisure activities carried out in a day was (61.6%) were watching T.V, (20%) were involved other than exercise, gardening, playing, and watching T.V, (6.7%) were exercise, and none of them involved in gardening.

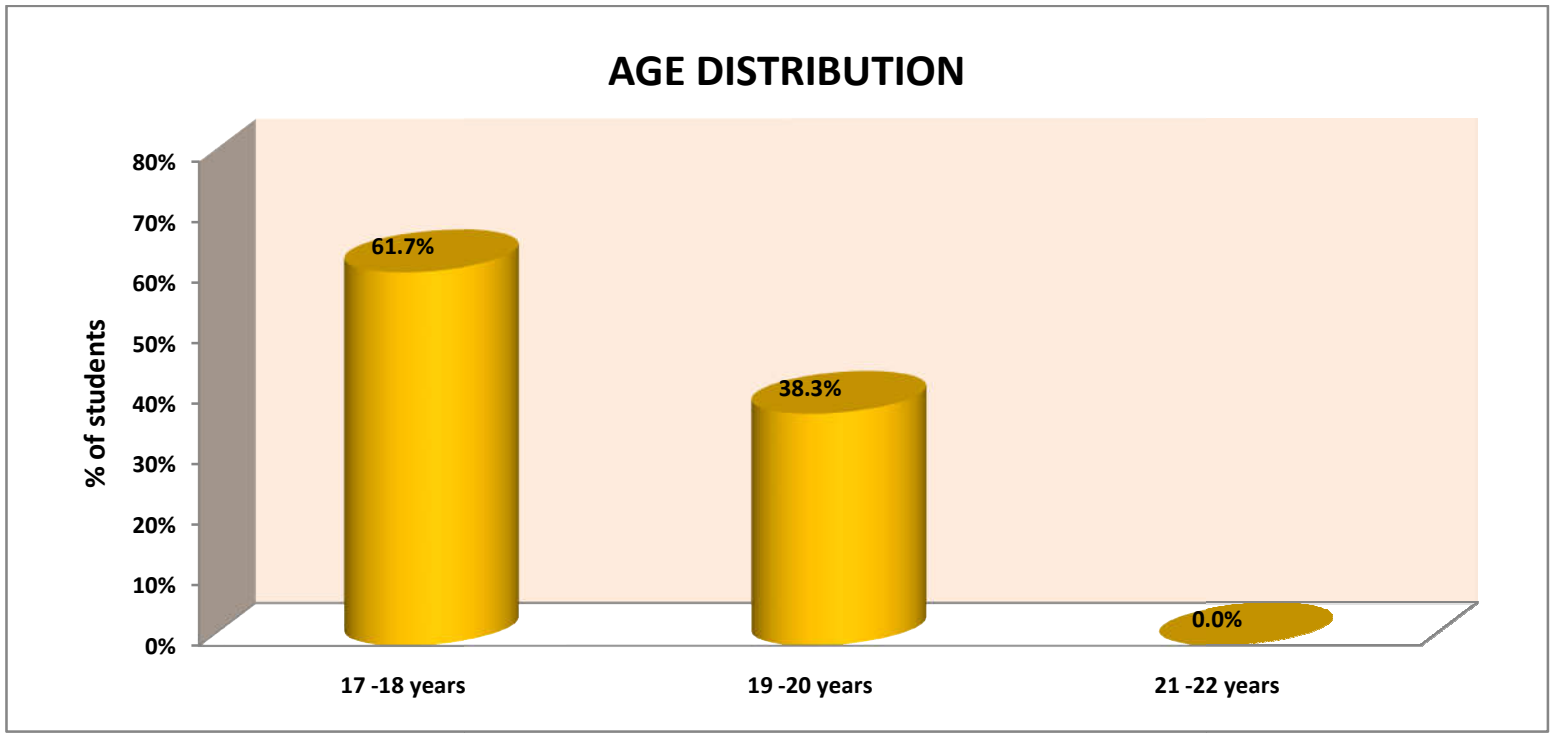


Fig 4.1. Simple cylinder diagram depicts distribution of nursing students according to their age.

Among 60 nursing students (61.7%) were 17 – 18 years of age group, (38.3%) were 19-20 years and none of them in the age group of 21 – 22 years.

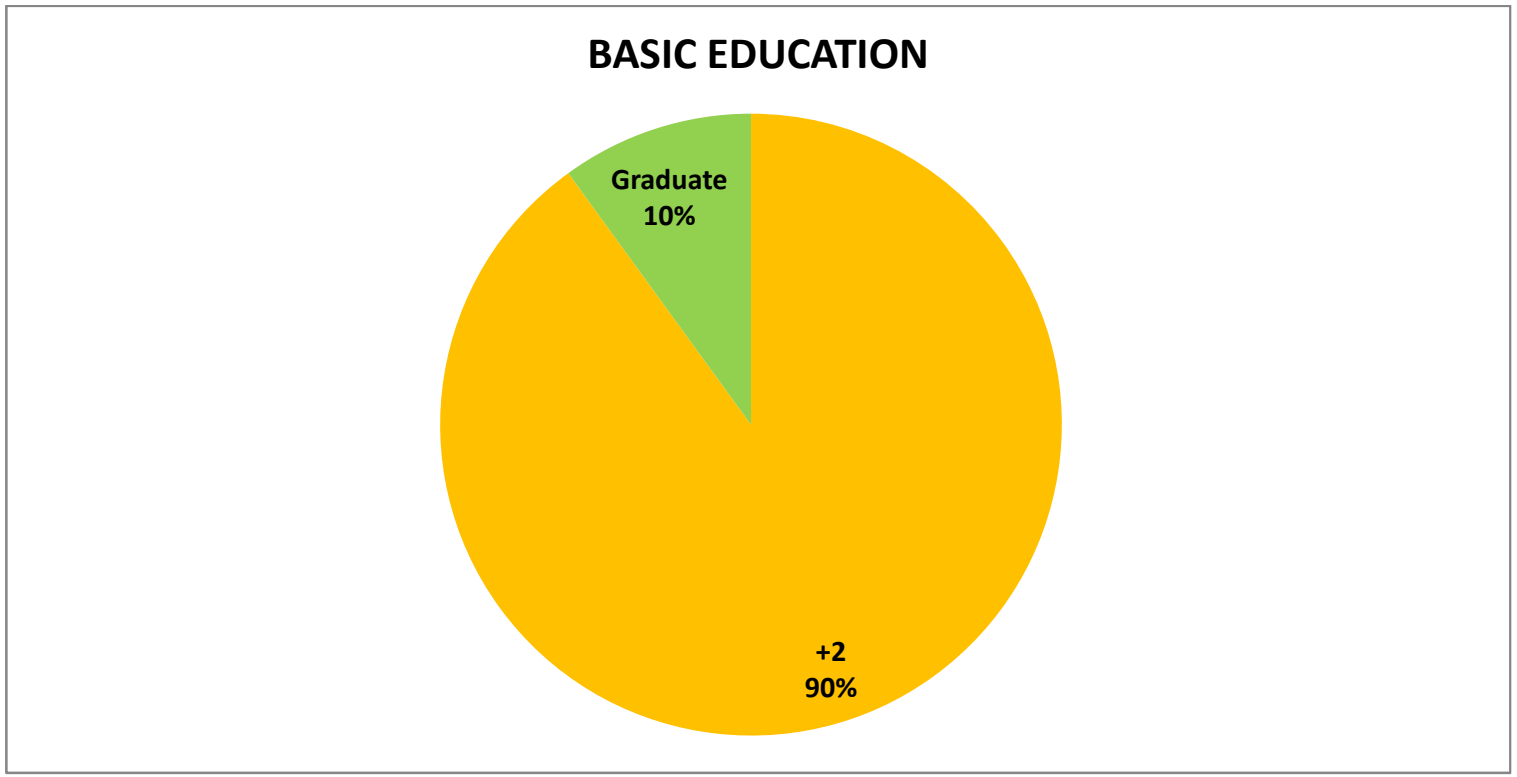


Fig 4.2 Pie diagram portrays distribution of nursing students according to their basic education.

The above diagram portrays that the majority of the nursing students were (90%) had +2, (10%) had graduate.

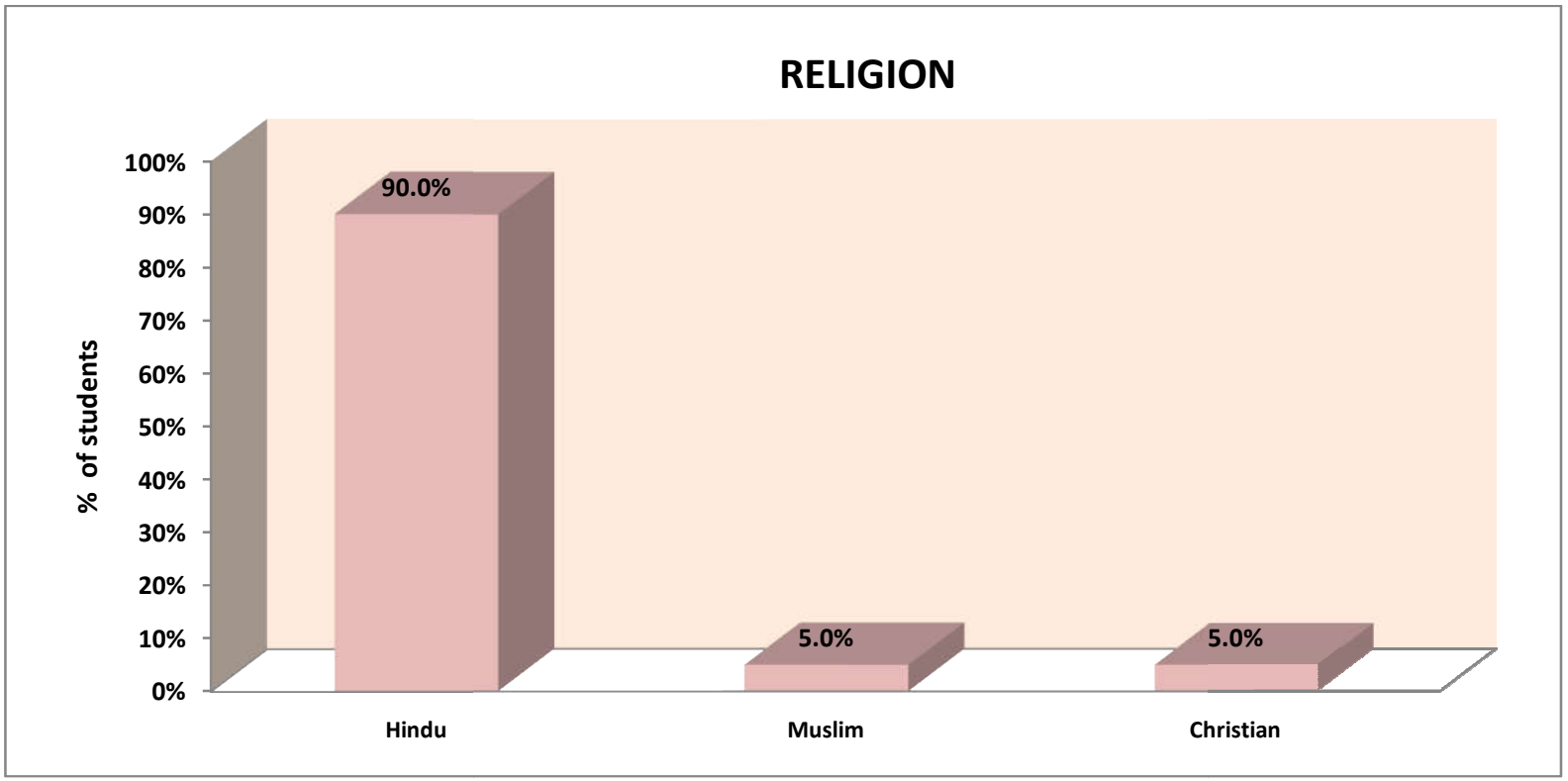


Fig 4.3 bar diagram identifies distribution of nursing students according to their religion.

The above diagram identifies that the most of the nursing students (90%) were Hindu, (5%) were Muslim, and (5%) were Christian.

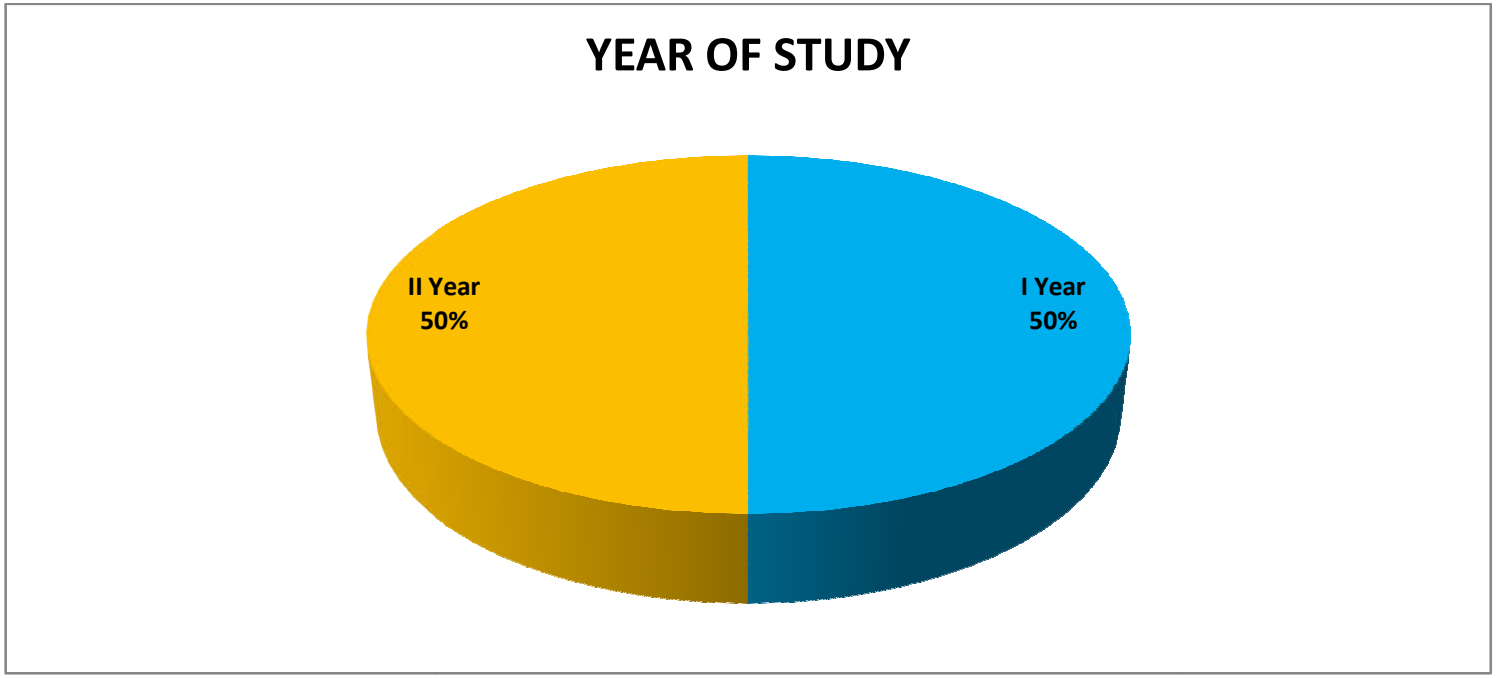


Fig 4.4 Pie diagram states the distribution of nursing students according to their year of study

The above diagram states the nursing students (50%) were from I year, (50%) were from II year according to their year of study.

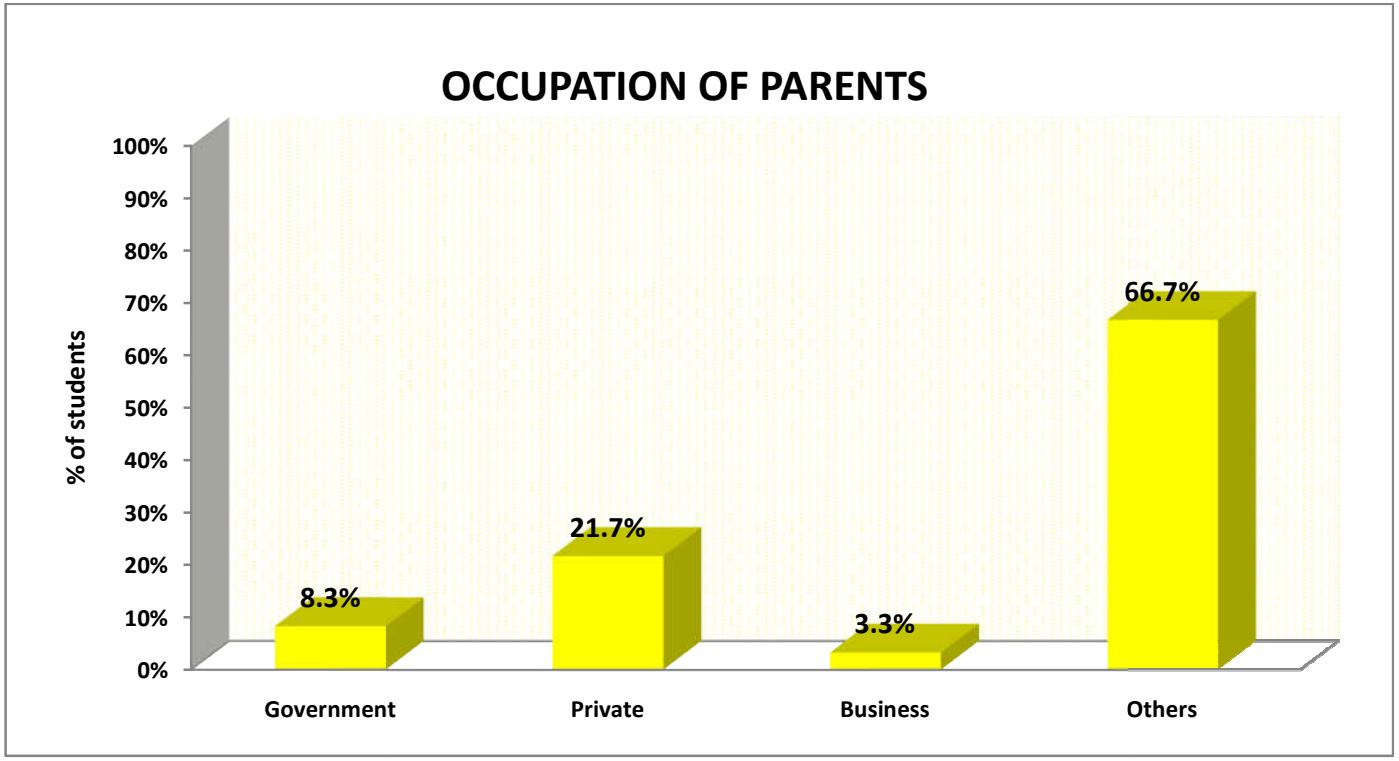


Fig 4.5 Simple bar diagram depicts the distribution of nursing according to their occupation of parents

The above diagram depicts that the majority (21.7%) were private job, (8.3%) were government job, (3.3%) were business and (66.7%) were other than the private, government and business occupation of their parents.

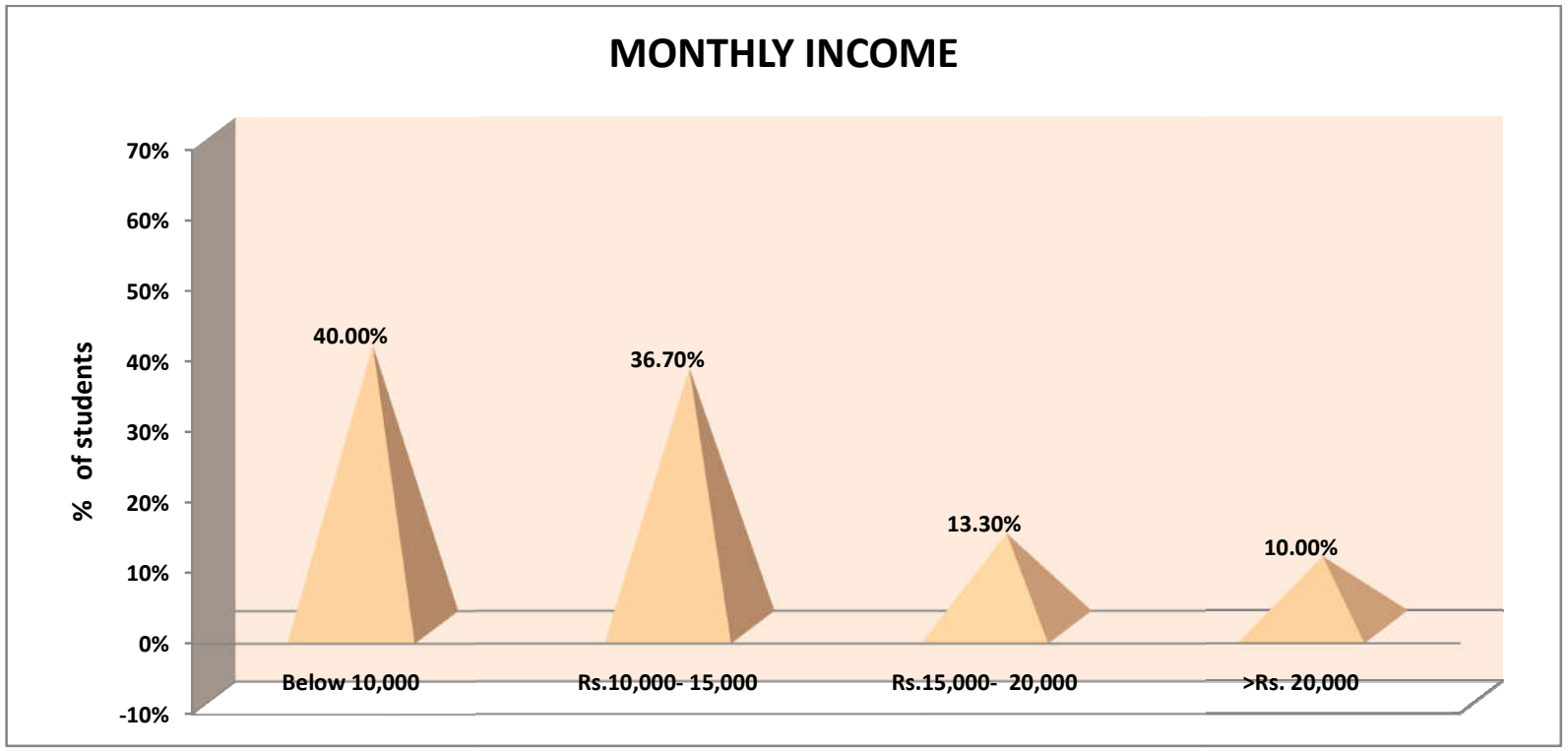


Fig 4.6 Pyramid diagram manifests distribution of nursing students according to their monthly family income

The above diagram manifests that the majority (40%) of students family income was below 10,000, (36.7%) was Rs. 10,000-15,000, (13.3%) was Rs.15,000-20,000, (10%) was >Rs. 20,000.

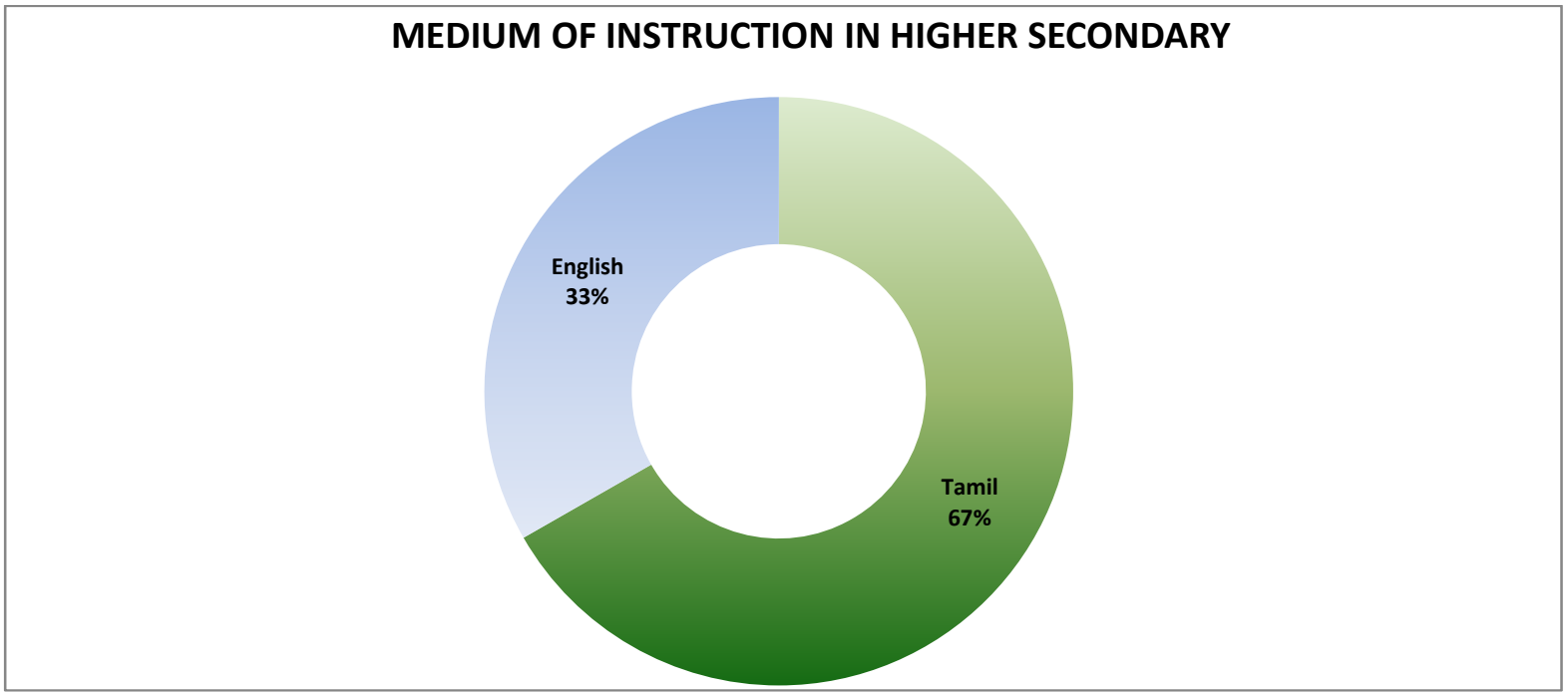


Fig 4.7 Doughnut diagram explains distribution of nursing students according to their medium of instruction in higher secondary

The above diagram explains that the majority of the nursing students (66.7 %) were Tamil medium, (33.3%) were English medium in higher secondary education.

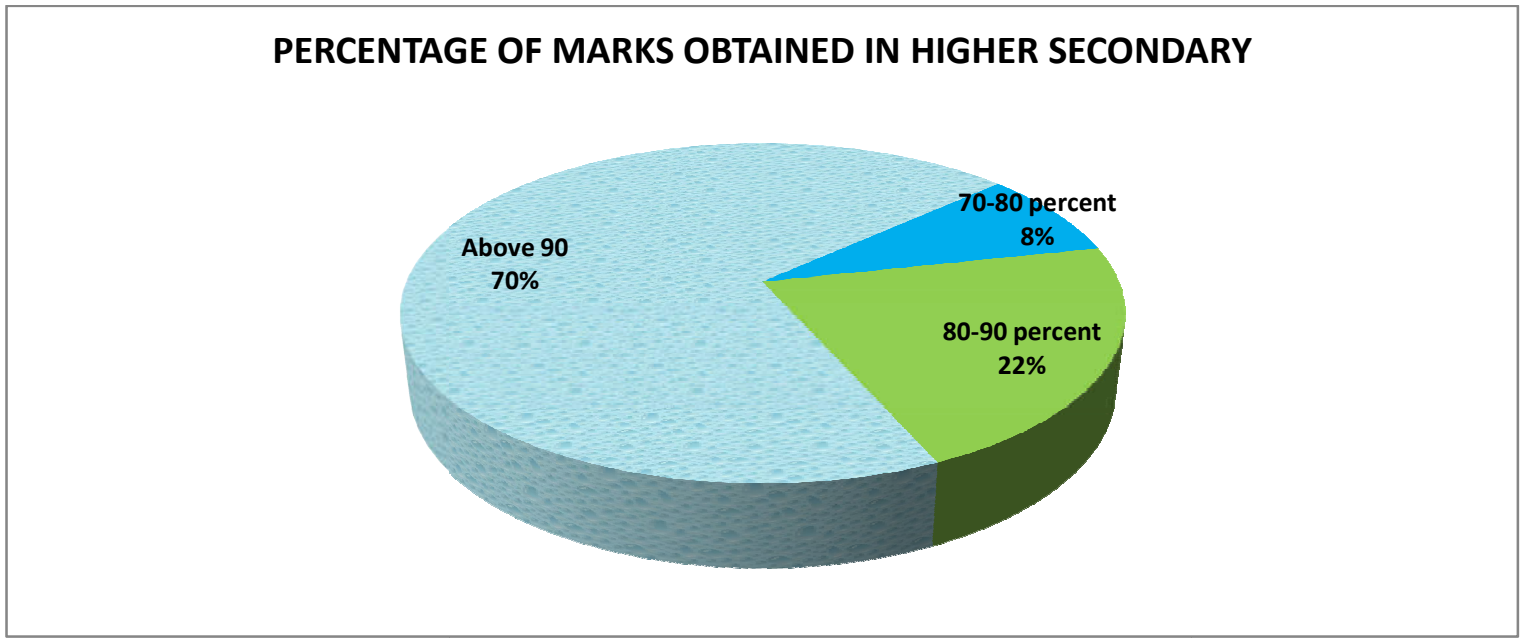


Fig 4.8 Pie diagram narrates distribution of nursing students according to their percentage of marks obtained in higher secondary.

The above diagram narrates that the majority of the nursing students (70%) were got above 90 percentage, (21.7%) were got 80-90 percentage, (8.3%) were got 70-80 percentage of marks obtained in higher secondary.

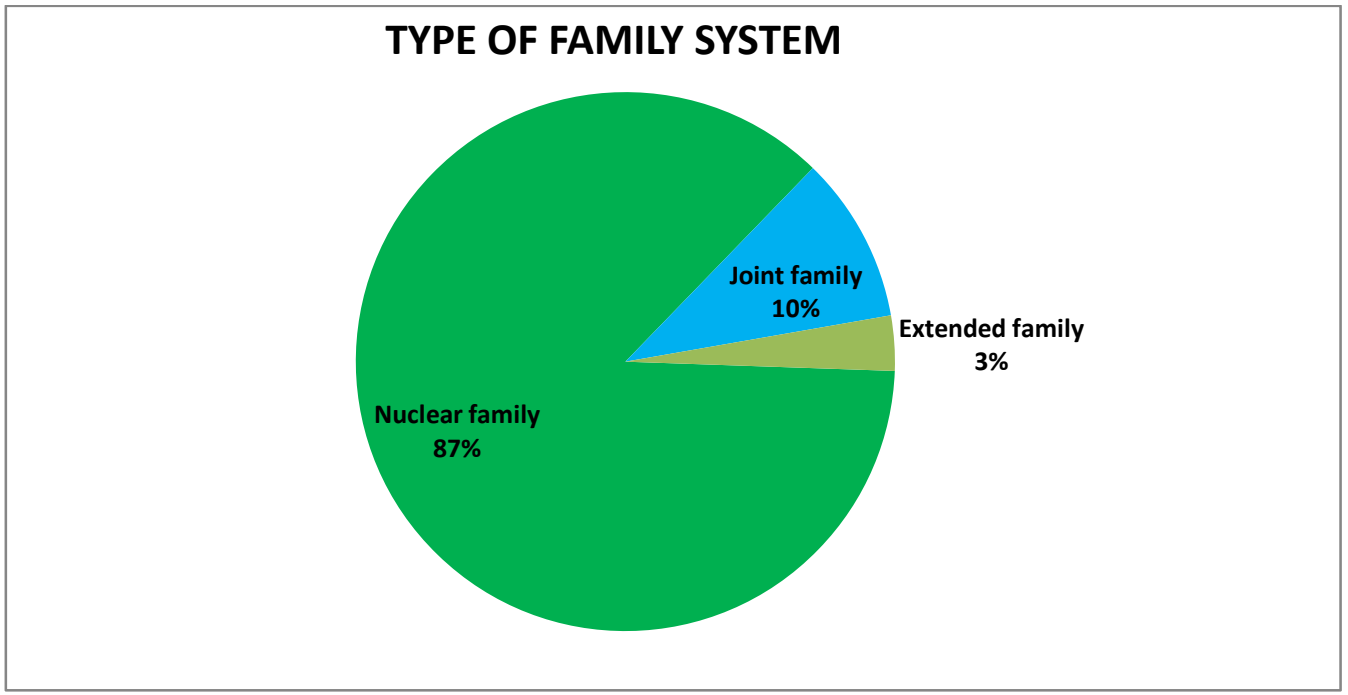


Fig 4.9 Pie diagram identifies distribution of nursing students according to their type of family system.

The above diagram identifies that the majority of nursing students (86.7%) were nuclear family, (10%) were joint family, (3.3%) were extended family.

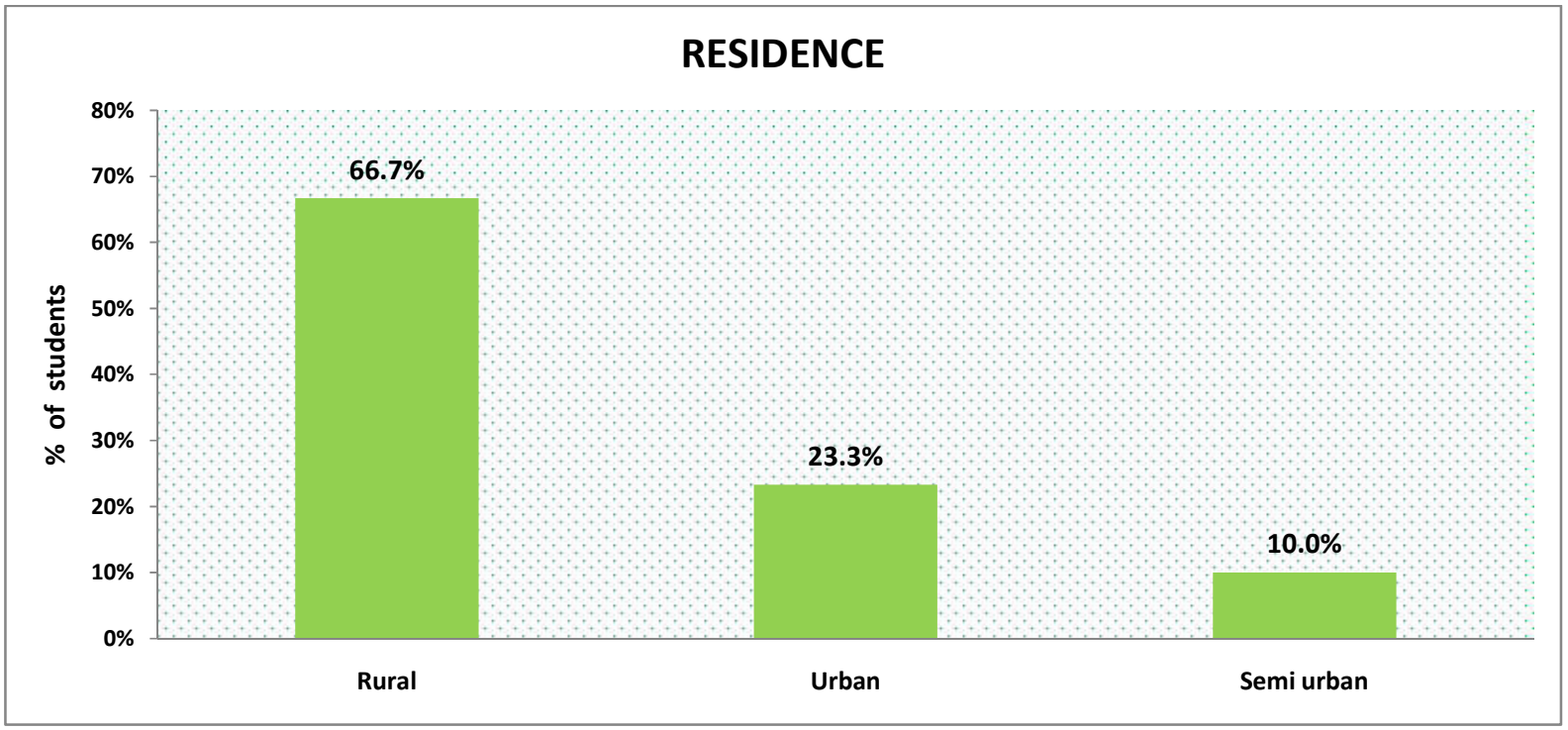


Fig 4.10 Simple bar diagram explains distribution of nursing students according to their residence.

The above diagram explains that (66.7%) were from rural, (23.3%) were from urban, (10%) were from semi urban.

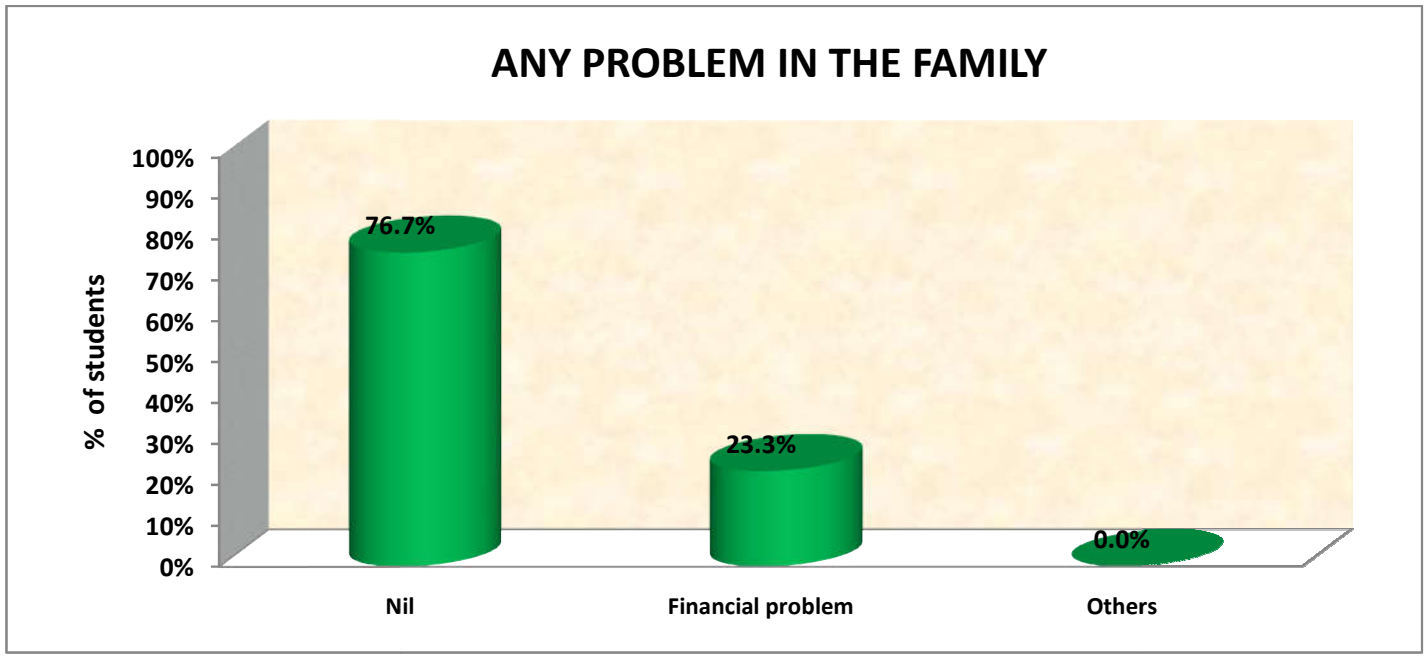


Fig 4.11 simple cylinder diagram depicts distribution of nursing students according to any problem in the family.

The above diagram depicts majority of the students (76.7%) didn't have any problem in their family, (23.3%) had financial problem.

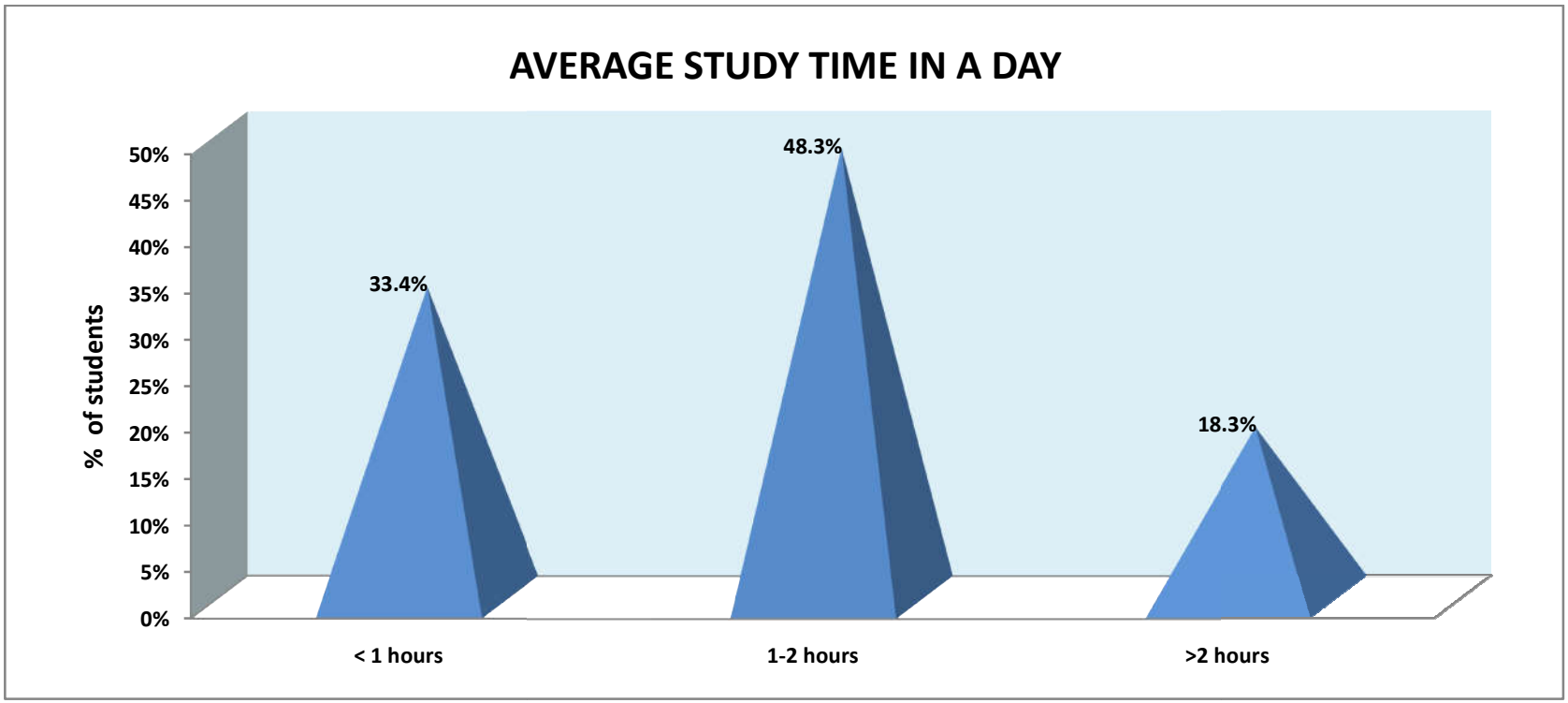
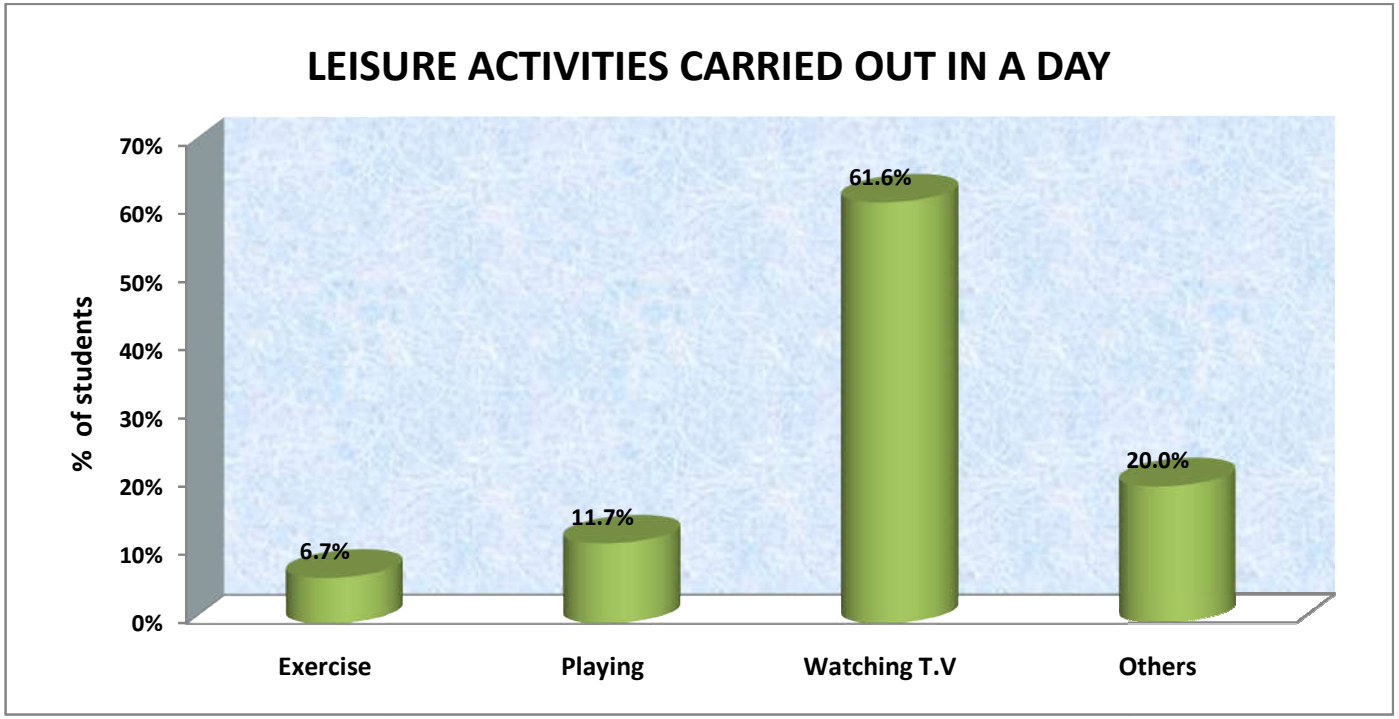


Fig 4.12 Pyramid diagram states the distribution of nursing students according to their average study time in a day.

The above diagram states that (48.3%) were studying 1-2 hours, (33.4%) were studying less than 1 hour, and (18.3%) were studying more than 2 hours.



A fig 4.13 cylinder diagram narrates distribution of nursing students according to leisure activities carried out in a day.

The above diagram narrates that the majority (61.6%) were watching T.V, (20%) were involved other than exercise, gardening, playing, and watching T.V, (6.7%) were exercise, and none of them involved in gardening.

SECTION II

Table 4.2: pretest level of stress among nursing students before administering calisthenic exercise

sno	Items	Never	Almost never	Sometimes	Fairly often	Very often
1	In the last month, how often have you been upset because of something that happened unexpectedly?	6	4	29	18	3
2	In the last month, how often have you felt that you were unable to control the important things in your life?	2	12	24	15	7
3	In the last month, how often have you felt nervous and stressed?	2	5	25	16	12
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	5	9	27	9	10
5	In the last month, how often have you felt that things were going your way?	6	4	19	11	20
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	3	11	29	11	6
7	In the last month, how often have you been able to control irritations in your life?	1	16	22	11	10
8	In the last month, how often have you felt that you were on top of things?	4	2	15	23	16
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	2	12	25	16	5
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	1	17	19	11	12

The above table 4.2 shows the each question wise pre test level of perceived stress scale score among nursing students in a selected college of nursing at Chennai.

Table 4.3: Each question wise pre test percentage of perceived stress scale score

sno	Items	Maximum score	Mean score	SD	% of mean score
1	In the last month, how often have you been upset because of something that happened unexpectedly?	4	2.13	.98	53.25%
2	In the last month, how often have you felt that you were unable to control the important things in your life?	4	2.22	1.01	55.50%
3	In the last month, how often have you felt nervous and stressed?	4	2.52	1.02	63.00%
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	4	2.17	1.14	54.25%
5	In the last month, how often have you felt that things were going your way?	4	2.58	1.29	64.50%
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	4	2.10	.99	52.50%
7	In the last month, how often have you been able to control irritations in your life?	4	2.22	1.08	55.50%
8	In the last month, how often have you felt that you were on top of things?	4	2.75	1.10	68.75%
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	4	2.17	.96	54.25%
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	4	2.27	1.13	56.75%
	Total	40	23.12	4.64	57.80%

The above table 4.3 shows the each question wise pre test percentage of perceived stress scale score among nursing students in a selected college of nursing at Chennai.

Table 4.4: PRE TEST LEVEL OF STRESS AMONG NURSING STUDENTS

Level of stress	No. of Students	%
Low stress	0	0.0%
Moderate stress	42	70.0%
High perceived stress	18	30.0%
Total	60	100%

The above table 4.4 shows the students pre test level of stress score. In general, none of the students are having Low level stress score and 70.0% of them having moderate level of stress score and 30.0% of them are having high perceived level of stress score.

Stress score interpretation

0 – never 1 - almost never 2 – sometimes 3 - fairly often 4 - very often

Min=0 Max=4 Total questions=10 Maximum marks= 40

S no.	Grade	Percentage	Marks
1.	Low stress	1 – 33%	1 – 13
2.	Moderate stress	34 – 66%	14 – 26
3.	High perceived stress	67 – 100 %	27 – 40

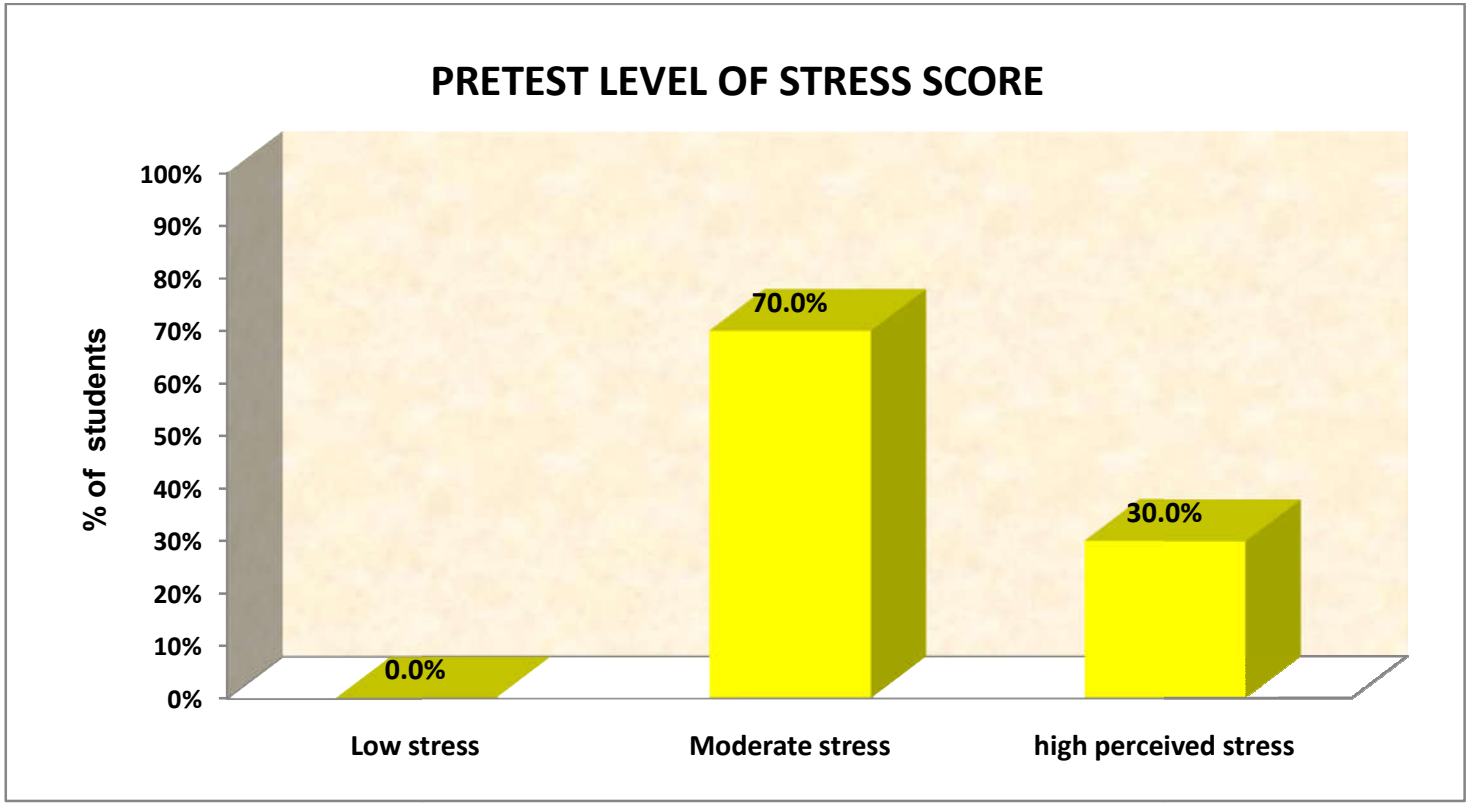


Fig 4.14 Pretest level of stress score among nursing students

SECTION III

Table 4.5: Post test level of stress among nursing students after administration of calisthenic exercise

S.no	Items	Never	Almost never	Sometimes	Fairly often	Very often
1	In the last month, how often have you been upset because of something that happened unexpectedly?	13	18	25	3	1
2	In the last month, how often have you felt that you were unable to control the important things in your life?	12	25	20	3	0
3	In the last month, how often have you felt nervous and stressed?	9	18	26	6	1
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	9	18	29	2	2
5	In the last month, how often have you felt that things were going your way?	13	19	20	5	3
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	8	16	26	10	0
7	In the last month, how often have you been able to control irritations in your life?	7	23	24	6	0
8	In the last month, how often have you felt that you were on top of things?	12	27	16	5	0
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	8	23	22	6	1
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	9	28	22	0	1

The above table 4.5 shows the each question wise post test level of perceived stress scale score among nursing students in a selected college of nursing at Chennai.

Table 4.6: Each question wise post test percentage of perceived stress scale score

S.no	Items	Maximum score	Mean score	SD	% of mean score
1	In the last month, how often have you been upset because of something that happened unexpectedly?	4	1.35	.94	33.75 %
2	In the last month, how often have you felt that you were unable to control the important things in your life?	4	1.23	.83	30.75 %
3	In the last month, how often have you felt nervous and stressed?	4	1.53	.93	38.25 %
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	4	1.50	.91	37.50 %
5	In the last month, how often have you felt that things were going your way?	4	1.43	1.08	35.75 %
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	4	1.63	.92	40.75 %
7	In the last month, how often have you been able to control irritations in your life?	4	1.48	.83	37.00 %
8	In the last month, how often have you felt that you were on top of things?	4	1.23	.87	30.75 %
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	4	1.48	.91	37.00 %
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	4	1.27	.78	31.75 %
	Total	40	14.18	3.20	35.45 %

The above table 4.6 shows the each question wise post test percentage of perceived stress scale score among nursing students in a selected college of nursing at Chennai.

TABLE 4.7: POST TEST LEVEL OF STRESS

Level of stress	**No. of Students**	**%**
Low stress	29	48.3%
Moderate stress	31	51.7%
High perceived stress	0	0.0%
Total	60	100%

The above table 4.7 shows the students post-test level of stress score. In general 48.3% of students are having low level of stress score, 51.7% of them having moderate level of stress score and none of them are having high perceived level of stress score.

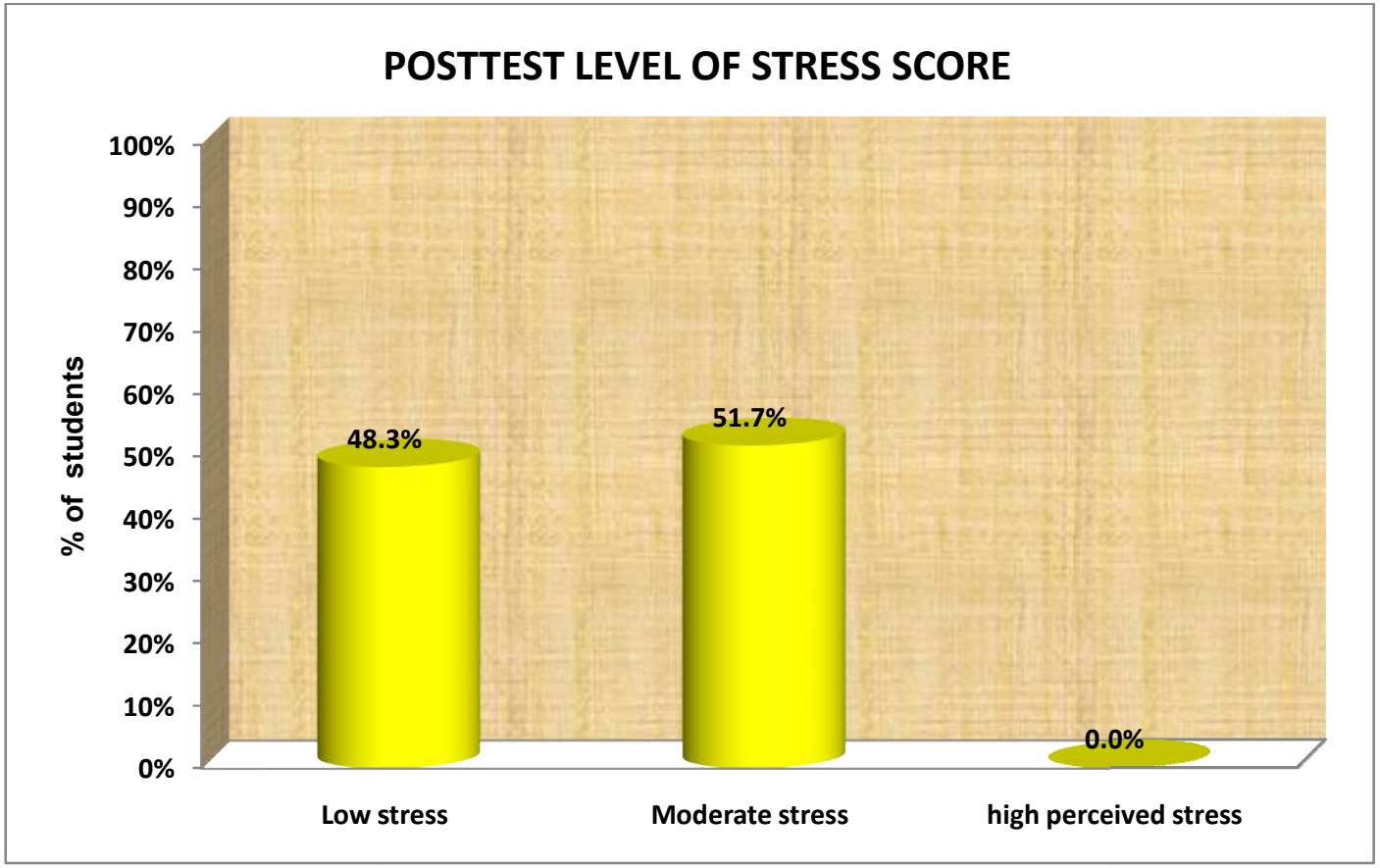


Fig 4.15 Post test level of stress among nursing students

SECTION IV

Table 4. 8: Assess the effectiveness of calisthenic exercises on stress among nursing students

	Perceived Stress Scale Items	Pretest		Posttest		Mean Difference	Student's paired t-test
		Mean	SD	Mean	SD		
1	In the last month, how often have you been upset because of something that happened unexpectedly?	2.13	.98	1.35	.94	0.78	t=5.34P=0.001 *** DF= 59 , Significant
2	In the last month, how often have you felt that you were unable to control the important things in your life?	2.22	1.01	1.23	.83	0.99	t=5.40 P=0.001 *** DF= 59 , Significant
3	In the last month, how often have you felt nervous and stressed?	2.52	1.02	1.53	.93	0.99	t=5.60 P=0.001 *** DF= 59 , Significant
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	2.17	1.14	1.50	.91	0.67	t=4.15 P=0.001 *** DF= 59 , Significant
5	In the last month, how often have you felt that things were going your way?	2.58	1.29	1.43	1.08	1.15	t=6.00P=0.001 *** DF= 59 , Significant
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	2.10	.99	1.63	.92	0.47	t=3.50 P=0.001 *** DF= 59 , Significant

7	In the last month, how often have you been able to control irritations in your life?	2.22	1.08	1.48	.83	0.74	t=4.32 P=0.001 *** DF= 59 , Significant
8	In the last month, how often have you felt that you were on top of things?	2.75	1.10	1.23	.87	1.52	t=8.20 P=0.001 *** DF= 59 , Significant
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	2.17	.96	1.48	.91	0.69	t=4.35 P=0.001 *** DF= 59 , Significant
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	2.27	1.13	1.27	.78	1.00	t=5.30 P=0.001 *** DF= 59 , Significant

*** Very high significant at $p< 0.001$

The above table 4. 8 shows the comparison of pre test and post test stress score among nursing students.

Considering Stress regarding “In the last month, how often have you been upset because of something that happened unexpectedly? “, in pretest, students are having 2.13 score whereas in post-test they are having 1.35 score. Difference is 0.78. This difference is large and it is statistically significant difference.

Considering stress regarding “In the last month, how often have you felt that you were unable to control the important things in your life?” in pretest students are having 2.22 score whereas in posttest they are having 1.23 score. Difference is 0.99. This difference is large and it is statistically significant difference.

Considering stress regarding, “In the last month, how often have you felt nervous and stressed?” in pretest students are having 2.52 score whereas in posttest they are having 1.53score. Difference is 0.99. This difference is large and it is statistically significant difference.

Considering stress regarding, “In the last month, how often have you felt confident about your ability to handle your personal problems?”. In pretest students are having 2.17 score whereas in posttest they are having 1.50 score. Difference is 0.67. This difference is large and it is statistically significant difference.

Considering stress regarding “In the last month, how often have you felt that things were going your way?” in pretest students are having 2.58 score whereas in posttest they are having 1.43 score. Difference is 1.15. This difference is large and it is statistically significant difference.

Considering stress regarding, “In the last month, how often have you found that you could not cope with all the things that you had to do?, in pretest , students are having 2.10 score whereas in posttest they are having 1.63 score. Difference is 0.47. This difference is large and it is statistically significant difference.

Considering stress regarding “In the last month, how often have you been able to control irritations in your life?” in pretest , students are having 2.22 score whereas in posttest they are having 1.48 score. Difference is 0.74. This difference is large and it is statistically significant difference.

Considering stress regarding “In the last month, how often have you felt that you were on top of things?, in pretest , students are having 2.75 score whereas in posttest they are having 1.23score. Difference is 1.52. This difference is large and it is statistically significant difference.

Considering stress regarding “In the last month, how often have you been angered because of things that happened that were outside of your control?, in pretest , students are having 2.17 score where as in

posttest they are having 1.48 score. Difference is 0.69. This difference is large and it is statistically significant difference.

Considering stress regarding, “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?” in pretest , students are having 2.27 score whereas in posttest they are having 1.27 score. Difference is 1.00. This difference is large and it is statistically significant difference.

Significance of difference between pretest and posttest score was calculated using student paired t-test

Table 4.9: COMPARISON OF OVERALL STRESS SCORE BEFORE AND AFTER CALISTHENIC EXERCISES

	No.Of students	**Pretest Mean±SD**	**Posttest Mean±SD**	**MeandifferenceMean±SD**	**Student’S paired t-test**
Overall Stress Score	60	23.12 ± 4.64	14.18 ± 3.20	8.94 ± 3.83	t=17.81 P=0.001*** DF = 59, significant

*** very high significant at P≤0.001

Table 4.9 shows the comparison of overall stress before and after the administration of; calisthenic exercises. On an average, students are reduced their stress from 23.12 to 14.18 after the administration of calisthenic exercise. Difference is 8.94, this difference is statistically significant. Statistical significance was calculated by using student’s paired ‘t’test.

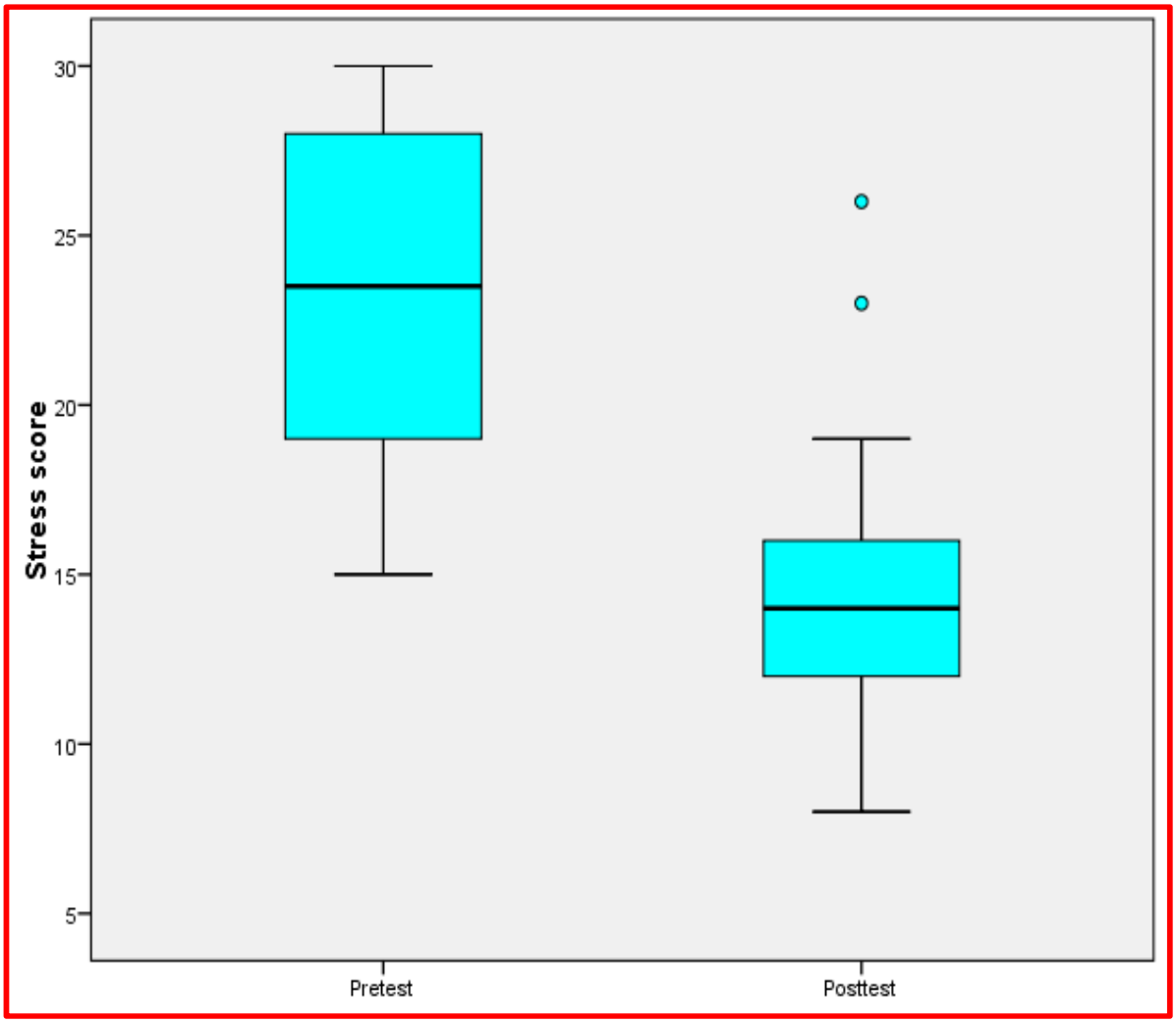


Fig 4.16: Box Plot compares the students pretest and posttest stress score

Table 4.10: Each question wise pretest and posttest percentage of stress

sno	Perceived Stress Scale Items	Pretest stress	Posttest stress	% of stress reduction score
1	In the last month, how often have you been upset because of something that happened unexpectedly?	53.25%	33.75%	19.50%
2	In the last month, how often have you felt that you were unable to control the important things in your life?	55.50%	30.75%	24.75%
3	In the last month, how often have you felt nervous and stressed?	63.00%	38.25%	24.75%
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	54.25%	37.50%	16.75%
5	In the last month, how often have you felt that things were going your way?	64.50%	35.75%	28.75%
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	52.50%	40.75%	11.75%
7	In the last month, how often have you been able to control irritations in your life?	55.50%	37.00%	18.50%
8	In the last month, how often have you felt that you were on top of things?	68.75%	30.75%	38.00%

9	In the last month, how often have you been angered because of things that happened that were outside of your control?	54.25%	37.00%	17.25%
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	56.75%	31.75%	25.00%
	Overall	57.80%	35.45%	22.35%

The above table 4.10 shows each question wise pretest and posttest percentage of stress among nursing student.

Table 4.11: Comparison of pretest and posttest level of stress score

Level of stress	**Pretest**		**Posttest**		**Generalized McNemar's test**
	n	%	n	%	
Low stress	0	0.0%	29	48.3%	$\chi 2$=43.33 P=0.001***(S)
Moderate stress	42	70.0%	31	51.7%	
High perceived stress	18	30.0%	0	0.0%	
Total	60	100.0%	60	100.0%	

***significant at p<0.001 level

Table 4.11shows the pre-test and post-test level of stress score among nursing students

Before calisthenic exercise, none of the students are having low level stress score and 70.0% of them having moderate level of stress score and 30.0%of them are having high perceived level of stress score.

After calisthenic exercise, 48.3% of students are having low level of stress score, 51.7% of them having moderate level of stress score and none of them are having high perceived level of stress score.Level of stress reduction score between pretest and posttest was calculated using Generalised McNemar's chi square test.

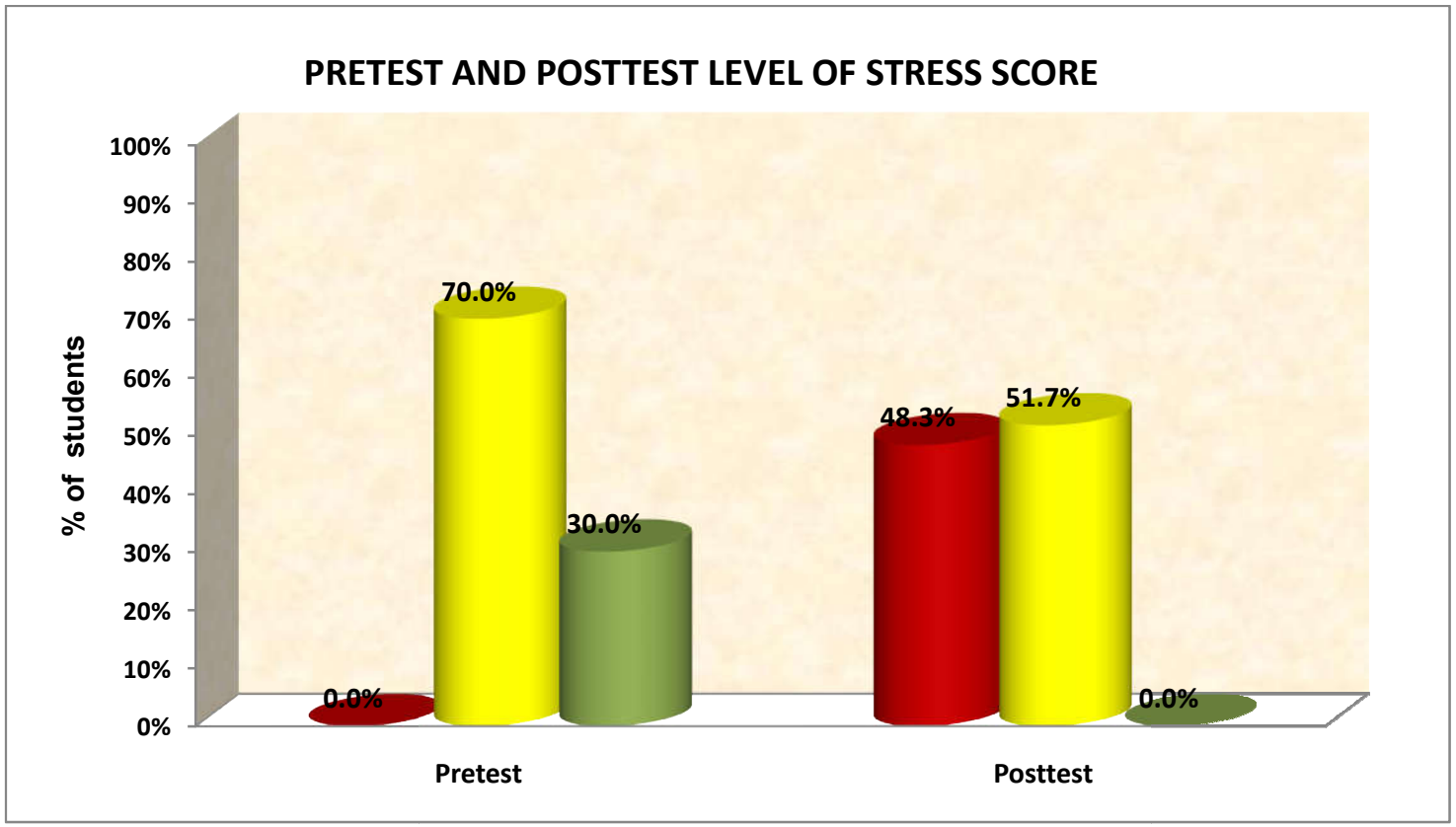


Fig 4.17 Pretest and post test level of stress score among nursing students

Section IV Assess the effectiveness of the calisthenic exercise among nursing students

Table 4.12: Effectiveness and generalization of calisthenic exercise

	Max score	**Mean score**	**Mean Difference of stress reduction score with 95% Confidence interval**	**Percentage Difference of stress reduction score with 95% Confidence interval**
Pretest	40	23.12	8.94(7.93 – 9.93)	22.35 %(19.83% – 24.83%)
Posttest	40	14.18		

Table 4.12 shows the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai.

On an average, in post test after having calisthenic exercises, students are reduced 22.35% stress score than pretest score. Differences and generalization of stress reduction score between pre test and post test score was calculated using and mean difference with 95% CI and proportion with 95% CI.

In this study effectiveness of the study is point estimate of 22.35% and interval estimate is 19.83% to 24.83%. It means in this similar setup of the study, whom ever conducted, 95 % we can assure, effectiveness of the study will lies between 19.83 to 24.83% stress score reduction.

SECTION V

4.13: Association between the post test level of stress and selected demographic variables among nursing students.

Demographic variables		Pretest level of stress score						N	Chi square test
		Low		Moderate		High perceived			
		n	%	n	%	n	%		
Age in years	17 -18 years	0	0.0 %	26	70.3%	11	29.7%	37	$\chi 2$=0.01 P=0.95 (NS)
	19 -20 years	0	0.0 %	16	69.6%	7	30.4%	23	
	21 -22 years	0	0.0 %	0	0.0%	0	0.0%	0	
Basic Education	+ 2	0	0.0 %	39	72.2%	15	27.8%	54	$\chi 2$=1.27 P=0.26 (NS)
	Graduate	0	0.0 %	3	50.0%	3	50.0%	6	
Religion	Hindu	0	0.0 %	38	70.4%	16	29.6%	54	$\chi 2$=0.03 P=0.98 (NS)
	Muslim	0	0.0 %	2	66.7%	1	33.3%	3	
	Christian	0	0.0 %	2	66.7%	1	33.3%	3	
Year of study	I Year	0	0.0 %	20	66.7%	10	33.3%	30	$\chi 2$=0.31 P=0.57 (NS)
	II Year	0	0.0 %	22	73.3%	8	26.7%	30	
Occupation of parents	Governme nt	0	0.0 %	3	60.0%	2	40.0%	5	$\chi 2$=1.65 P=0.64 (NS)
	Private	0	0.0 %	8	61.5%	5	38.5%	13	
	Business	0	0.0 %	2	100.0 %	0	0.0%	2	
	Others	0	0.0 %	29	72.5%	11	27.5%	40	
Family Monthly income	Below 10,000	0	0.0 %	16	66.7%	8	33.3%	24	$\chi 2$=1.36 P=0.71 (NS)
	Rs.10,000-15,000	0	0.0 %	15	68.2%	7	31.8%	22	
	Rs.15,000-20,000	0	0.0 %	7	87.5%	1	12.5%	8	

	>Rs. 20,000	0	0.0 %	4	66.7%	2	33.3%	6	
Medium of the instruction in higher secondary education	Tamil	0	0.0 %	27	67.5%	13	32.5%	40	$\chi 2$=0.35 P=0.55 (NS)
	English	0	0.0 %	15	75.0%	5	25.0%	20	
Percentage of marks obtained in higher secondary	70-80 percent	0	0.0 %	3	60.0%	2	40.0%	5	$\chi 2$=0.97 P=0.61 (NS)
	80-90 percent	0	0.0 %	8	61.5%	5	38.5%	13	
	Above 90	0	0.0 %	31	73.8%	11	26.2%	42	
Types of family	Nuclear	0	0.0 %	35	67.3%	17	32.7%	52	$\chi 2$=3.13 P=0.20 (NS)
	Joint	0	0.0 %	6	100.0 %	0	0.0%	6	
	Extended	0	0.0 %	1	50.0%	1	50.0%	2	
Residence	Rural	0	0.0 %	29	72.5%	11	27.5%	40	$\chi 2$=1.27 P=0.52 (NS)
	Urban	0	0.0 %	10	71.4%	4	28.6%	14	
	Semi urban	0	0.0 %	3	50.0%	3	50.0%	6	
Any problems in the family	Nil	0	0.0 %	31	67.4%	15	32.6%	46	$\chi 2$=0.63 P=0.42 (NS)
	Financial problem	0	0.0 %	11	78.6%	3	21.4%	14	
	Others	0	0.0 %	0	0.0%	0	0.0%	0	
Average study time per day	< 1 hours	0	0.0 %	14	70.0%	6	30.0%	20	$\chi 2$=0.05 P=0.97 (NS)
	1-2 hours	0	0.0 %	20	69.0%	9	31.0%	29	
	>2 hours	0	0.0 %	8	72.7%	3	27.3%	11	
Leisure activities carried out	Exercise	0	0.0 %	2	50.0%	2	50.0%	4	$\chi 2$=3.91 P=0.27 (NS)
	Gardening	0	0.0	0	0.0%	0	0.0%	0	

in a day			%						
	Playing	0	0.0 %	5	71.4%	2	28.6%	7	
	Watching T.V	0	0.0 %	24	64.9%	13	35.1%	37	
	Others	0	0.0 %	11	91.7%	1	8.3%	12	

The above table 4.13 shows the association between pre test level of stress and their demographic variables of nursing students. None of the demographic variables are significantly associated with their pre test level of stress score. Statistical significance was calculated using chi square test.

Table 4.14: Association between posttest level of stress and their demographic variables

Demographic variables		Posttest level of stress score						N	Chi square test
		Low		Moderate		High perceived			
		n	%	n	%	n	%		
Age in years	17 -18 years	14	37.8%	23	62.2%	0	0.0%	37	**χ2=4.26 P=0.05* (S)**
	19 -20 years	15	65.2%	8	34.8%	0	0.0%	23	
	21 -22 years	0	0.0%	0	0.0%	0	0.0%	0	
Basic Education	+ 2	26	48.1%	28	51.9%	0	0.0%	54	χ2=0.01 P=0.93 (NS)
	Graduate	3	50.0%	3	50.0%	0	0.0%	6	
Religion	Hindu	27	50.0%	27	50.0%	0	0.0%	54	χ2=0.60 P=0.74 (NS)
	Muslim	1	33.3%	2	66.7%	0	0.0%	3	
	Christian	1	33.3%	2	66.7%	0	0.0%	3	
Year of study	I Year	11	36.7%	19	63.3%	0	0.0%	30	**χ2=4.73 P=0.09* (S)**
	II Year	20	66.7%	10	33.3%	0	0.0%	30	
Occupation of parents	Government	3	60.0%	2	40.0%	0	0.0%	5	χ2=1.72 P=0.63 (NS)
	Private	8	61.5%	5	38.5%	0	0.0%	13	
	Business	1	50.0%	1	50.0%	0	0.0%	2	
	Others	17	42.5%	23	57.5%	0	0.0%	40	
Family Monthly income	Below 10,000	9	37.5%	15	62.5%	0	0.0%	24	χ2=2.16 P=0.53 (NS)
	Rs.10,000-15,000	13	59.1%	9	40.9%	0	0.0%	22	
	Rs.15,000-20,000	4	50.0%	4	50.0%	0	0.0%	8	
	>Rs. 20,000	3	50.0%	3	50.0%	0	0.0%	6	
Medium of the	Tamil	15	37.5%	25	62.5%	0	0.0%	40	**χ2=5.63**

instruction in higher secondary education	English	14	70.0%	6	30.0%	0	0.0%	20	**P=0.02* (S)**
Percentage of marks obtained in higher secondary	70-80 percent	2	40.0%	3	60.0%	0	0.0%	5	$\chi 2$=0.92 P=0.63 (NS)
	80-90 percent	5	38.5%	8	61.5%	0	0.0%	13	
	Above 90	22	52.4%	20	47.6%	0	0.0%	42	
Types of family	Nuclear	25	48.1%	27	51.9%	0	0.0%	52	$\chi 2$=2.68 P=0.62 (NS)
	Joint	4	66.7%	2	33.3%	0	0.0%	6	
	Extended	0	0.0%	2	100.0%	0	0.0%	2	
Residence	Rural	24	60.0%	16	40.0%	0	0.0%	40	**$\chi 2$=8.68 P=0.01* (S)**
	Urban	2	14.3%	12	85.7%	0	0.0%	14	
	Semi urban	3	50.0%	3	50.0%	0	0.0%	6	
Any problems in the family	Nil	24	52.2%	22	47.8%	0	0.0%	46	$\chi 2$=1.16 P=0.28 (NS)
	Financial problem	5	35.7%	9	64.3%	0	0.0%	14	
	Others	0	0.0%	0	0.0%	0	0.0%	0	
Average study time per day	< 1 hours	10	50.0%	10	50.0%	0	0.0%	20	$\chi 2$=0.33 P=0.84 (NS)
	1-2 hours	13	44.8%	16	55.2%	0	0.0%	29	
	>2 hours	6	54.5%	5	45.5%	0	0.0%	11	
Leisure activities carried out in a day	Exercise	0	0.0%	4	100.0%	0	0.0%	4	$\chi 2$=6.88 P=0.08 (NS)
	Gardening	0	0.0%	0	0.0%	0	0.0%	0	
	Playing	2	28.6%	5	71.4%	0	0.0%	7	
	Watching T.V	22	59.5%	15	40.5%	0	0.0%	37	
	Others	5	41.7%	7	58.3%	0	0.0%	12	

The above table 4.14 shows the association between posttest level of stress and their demographic variables. 19 -20years age group of students, II year students, English medium students and urban students are reduced more stress score than others. Statistical significance was calculated using chi square test.

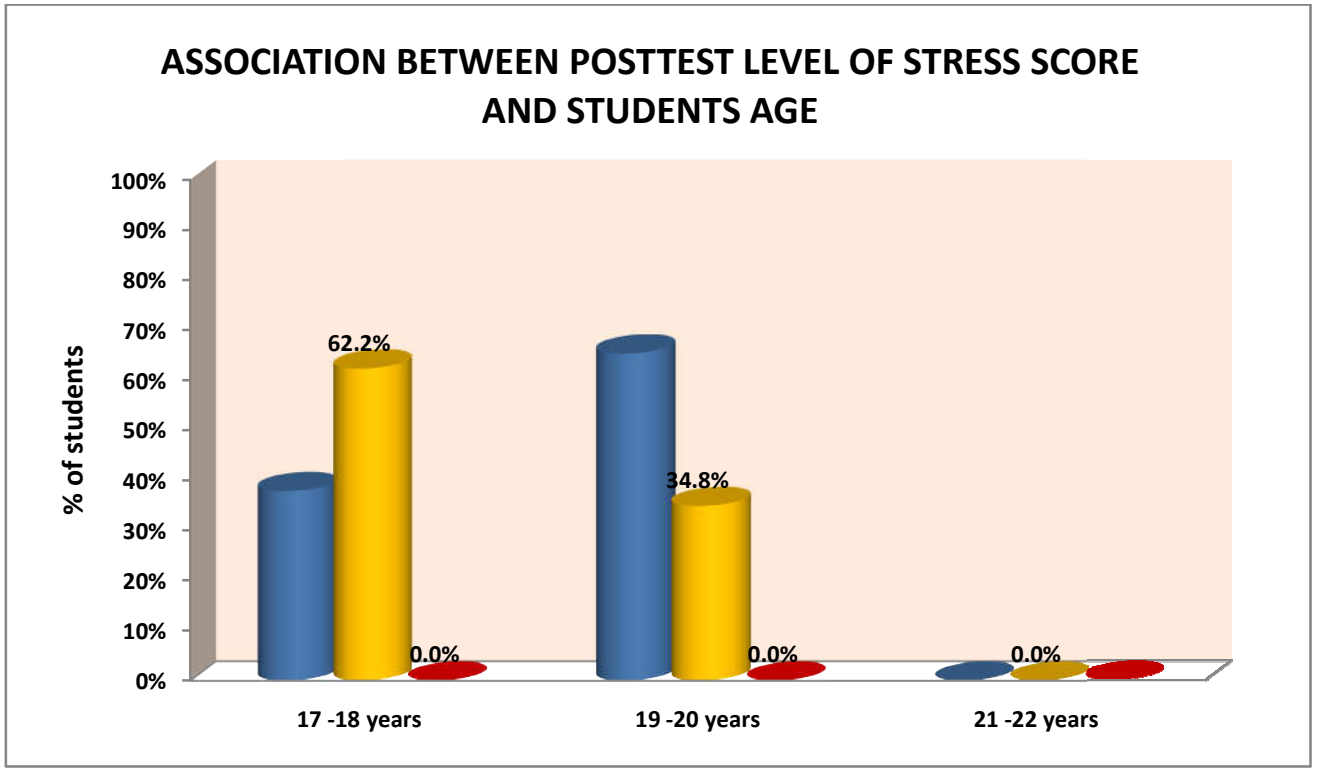


Fig 4.18 Association between posttest level of stress score and students age

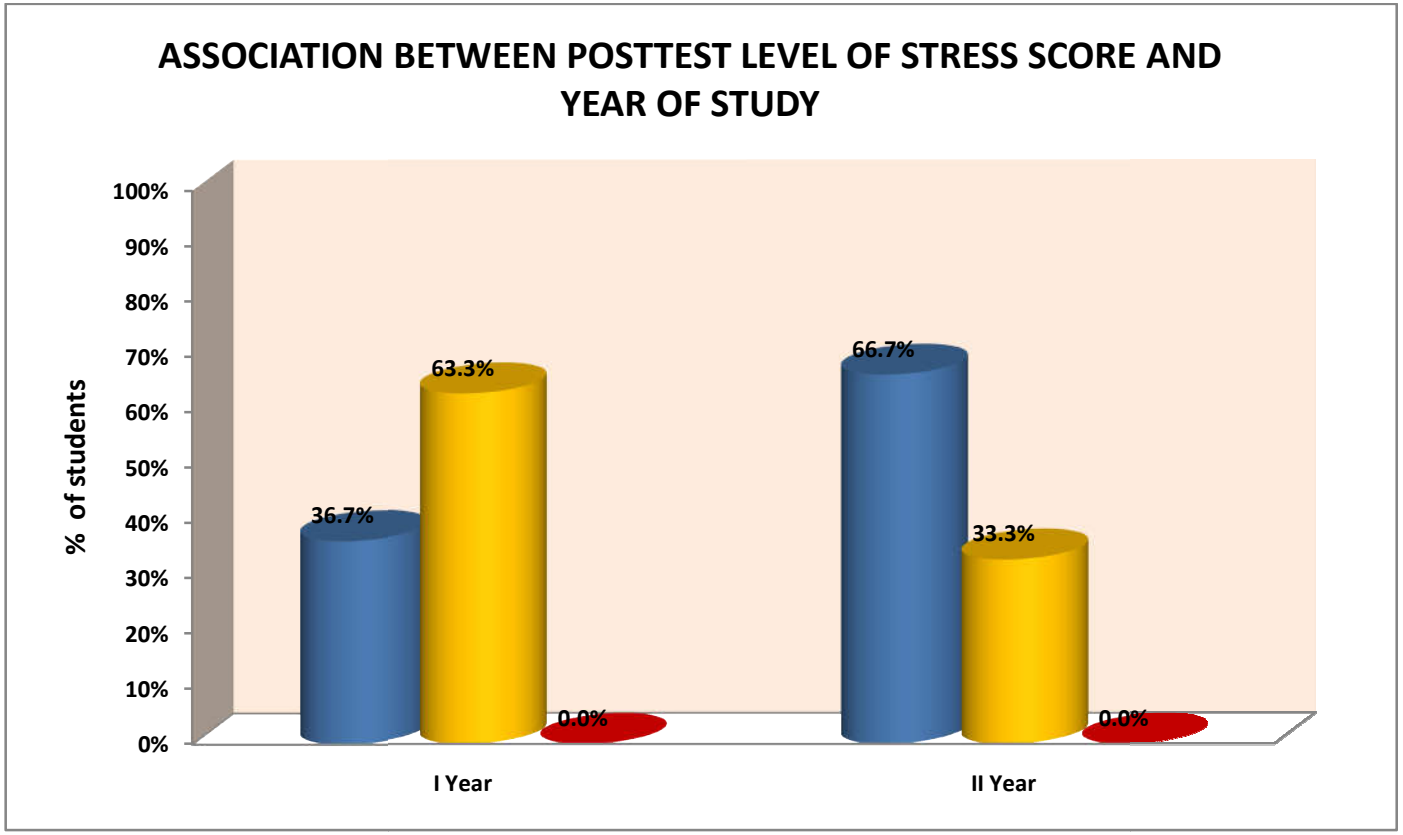


Fig 4.19 Association between post test level of stress score and year of study

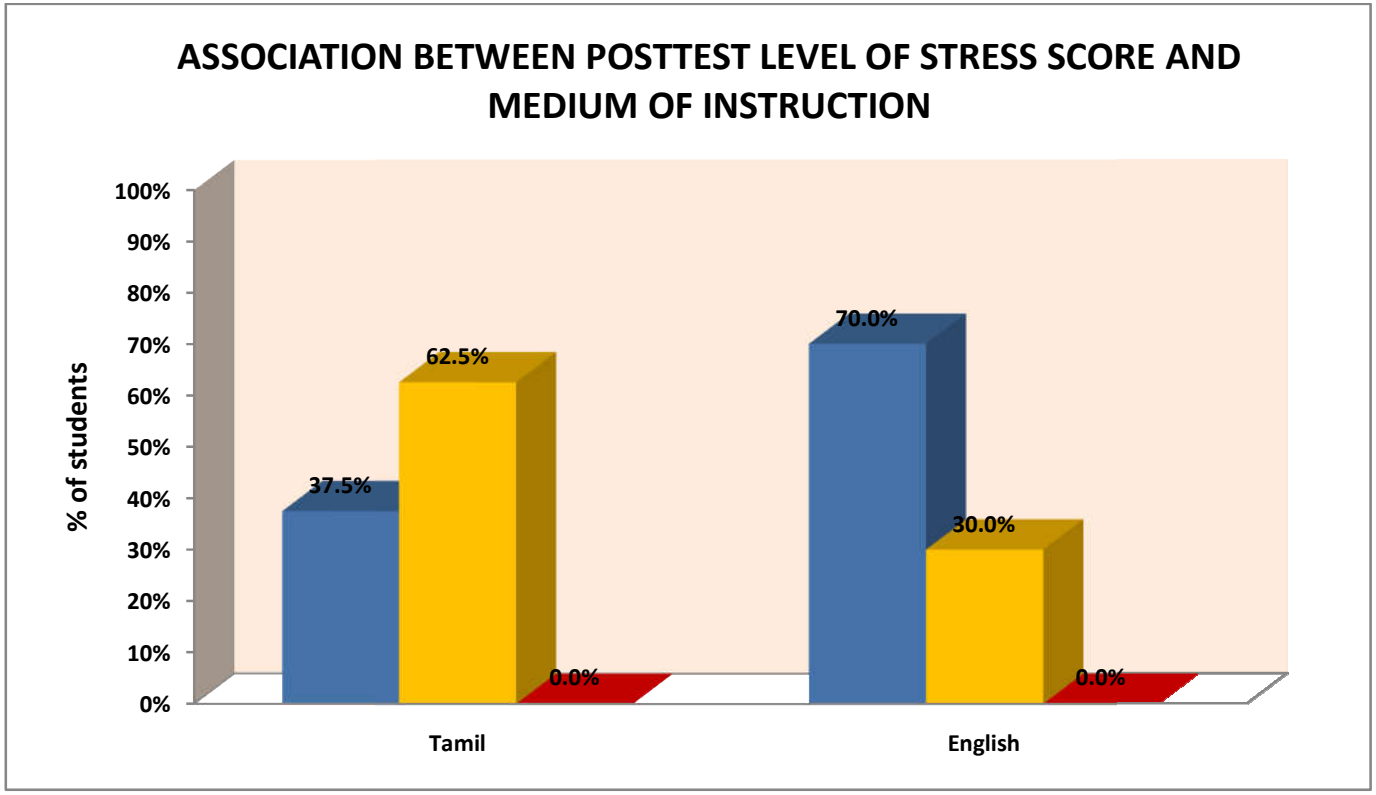


Fig 4.20 Association between posttest level of stress score and medium of instruction

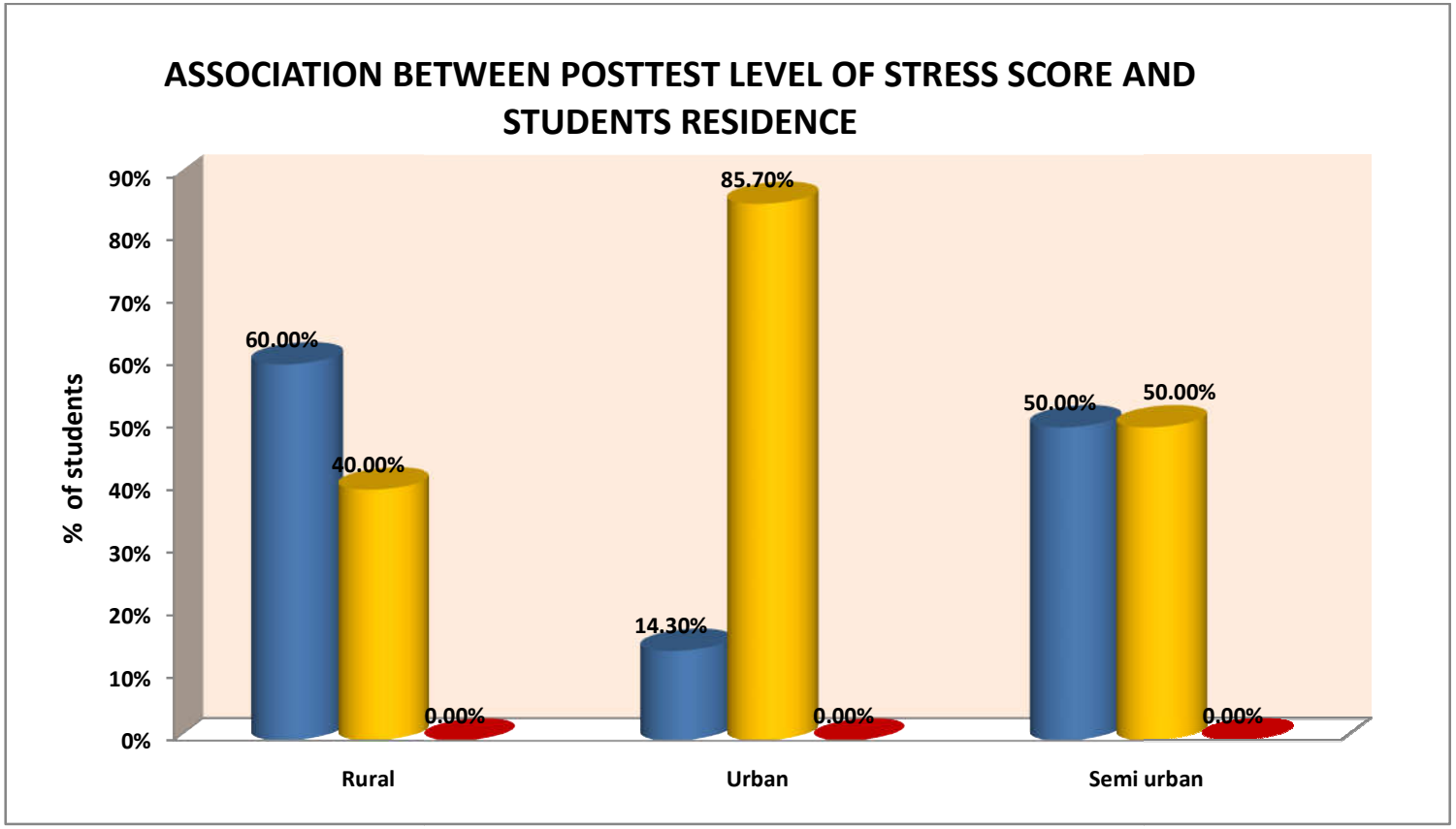


Fig 4.21 Association between posttest level of stress score and students residence

Table 4.15: Association between stress reduction score and demographic variables

Demographic variables		Stress reduction score						N	Chi square test
		Pretest		Posttest		Gain score=Post-Pre			
		Mean	SD	Mean	SD	Mean	SD		
Age in years	17 -18 years	22.95	4.85	14.93	2.93	8.02	4.29	37	**t=2.03P=0.05* (S)**
	19 -20 years	23.39	4.36	13.27	3.64	10.12	3.16	23	
	21 -22 years	0.00	0.00	0.00	0.00	0.00	0.00	0	
Basic Education	Plus Two	22.96	4.69	14.17	3.27	8.80	3.86	54	t=0.81 P=0.41 (NS)
	Graduate	24.50	4.18	14.33	2.73	10.17	4.26	6	
Religion	Hindu	22.96	4.80	14.04	3.05	8.93	3.86	54	F=0.34 P=0.71 (NS)
	Muslim	24.33	3.21	16.67	6.03	7.67	6.66	3	
	Christian	24.67	2.52	14.33	2.89	10.33	1.15	3	
Year of study	I Year	23.57	4.75	15.52	3.17	8.05	4.12	30	**t=2.00 P=0.05* (S)**
	II Year	22.67	4.55	13.70	3.27	8.97	3.61	30	
Occupation of parents	Government	23.80	5.81	16.00	6.00	7.80	3.77	5	F=0.45 P=0.71 (NS)
	Private	23.38	4.44	13.54	2.50	9.85	3.51	13	
	Business	23.50	.71	13.50	3.54	10.00	2.83	2	
	Others	22.92	4.78	14.20	2.99	8.73	4.10	40	
Family Monthly income	Below 10,000	23.58	4.75	14.13	2.98	9.46	4.06	24	F=0.39 P=0.75(NS)
	Rs.10,000 - 15,000	22.86	4.49	14.00	3.12	8.86	3.91	22	
	Rs.15,000 - 20,000	21.25	4.68	13.50	2.20	7.75	3.85	8	

	>Rs. 20,000	24.67	4.97	16.00	5.22	8.67	3.67	6	
Medium of the instruction in higher secondary education	Tamil	23.30	4.82	15.15	2.67	8.15	3.84	40	**t=1.99 P=0.05* (S)**
	English	22.75	4.35	12.47	4.11	10.28	3.99	20	
Percentage of marks obtained in higher secondary	70-80 percent	25.20	3.27	14.20	2.95	11.00	1.22	5	F=1.58 P=0.24 (NS)
	80-90 percent	24.15	4.24	14.23	2.35	9.92	2.75	13	
	Above 90	22.55	4.84	14.17	3.50	8.38	4.27	42	
Types of family	Nuclear	23.29	4.63	14.29	3.29	9.00	4.01	52	F=0.40 P=0.67 (NS)
	Joint	20.50	4.14	12.67	2.34	7.83	2.93	6	
	Extended	26.50	4.95	16.00	1.41	10.50	3.54	2	
Residence	Rural	22.63	4.92	13.65	2.56	7.21	3.96	40	**F=3.30 P=0.04* (S)**
	Urban	23.36	3.89	14.64	3.50	10.11	4.10	14	
	Semi urban	25.83	3.76	16.67	5.24	9.67	3.43	6	
Any problems in the family	Nil	23.22	4.70	14.22	3.46	9.00	3.81	46	t=0.06 P=0.81(NS)
	Financial problem	22.79	4.56	14.07	2.20	8.71	4.25	14	
	Others	0.00	0.00	0.00	0.00	0.00	0.00	0	
Average study time per day	< 1 hours	23.45	4.06	13.55	2.54	9.90	3.58	20	F=1.36 P=0.26 (NS)
	1-2 hours	22.86	5.28	14.76	3.74	8.10	4.30	29	
	>2 hours	23.18	4.12	13.82	2.64	9.36	2.94	11	

Leisure activities carried out in a day	Exercise	26.50	3.00	18.00	3.56	8.50	6.03	4	F=0.76 P=0.52 (NS)
	Gardening	0.00	0.00	0.00	0.00	0.00	0.00	0	
	Playing	23.86	5.58	15.29	3.09	8.57	4.54	7	
	Watching T.V	23.24	4.74	13.76	3.35	9.49	3.63	37	
	Others	21.17	3.69	13.58	1.51	7.58	3.68	12	

The above table 4.15 shows the association between level of stress reduction score and their demographic variables.19 -20years students, II year students, English medium students and urban students are reduced more stress score than others. Statistical significance was calculated using one way analysis of variance F-test and student independent t-test.

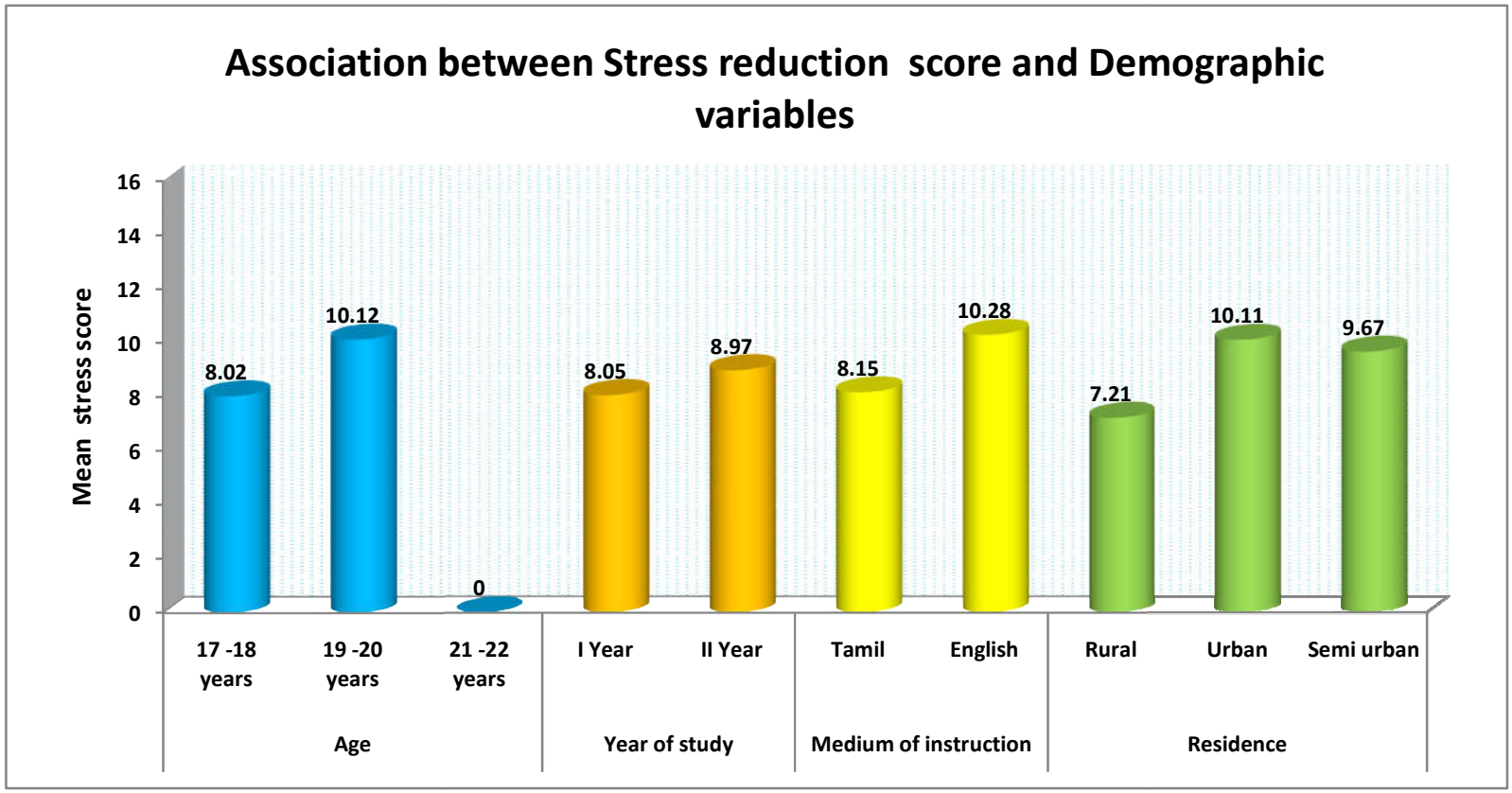


Fig 4.22 Association between stress reduction score and demographic variables

CHAPTER V
DISCUSSION

This chapter deals with detailed description of the study findings gathered from the statistical analysis. Stress is one of the major health issues of the nursing students. It has a significant long-term effect on individual, family and community. Understanding the effects of stress is the first important step towards addressing an issue. The data is gathered from the nursing students who revealed the negative aspects of stress and importance of calisthenics exercises.

The data was statistically analyzed and the finding was discussed under the objectives formulated by the researcher.

- **Section I:**
  Deals with the socio demographic variables of nursing students.
- **Section II:**
  Pretest level of stress among nursing students before administration of calisthenic exercise.
- **Section III:**
  Posttest level of stress among nursing students after administration of calisthenic exercise
- **Section IV:**
  Assess the effectiveness of calisthenics exercise on stress among nursing students.
- **Section V:**
  Association between the post test level of stress and selected demographic variables among nursing students.

The first objective of this study is to assess the existing level of stress among nursing students before calisthenic exercises intervention.

In general, none of the students are having mild level stress score and 70.0% of them having moderate level of stress score and 30.0%of them are having severe level of stress score.

My study consistent with this study which is conducted by

Seyed fatemi, Naiemeh, Tafreshi (2017) was conducted in 1991 to investigate the perception level and sources of stress across academic years among B.Sc nursing students, 94 students were recruited for the purpose. The findings of the study revealed that psychiatric problems were more prevalent in nursing students than the general population. Many items ranked as stressful among nursing students were also identified in general population. In addition, the study concluded that nursing students had the feelings 0f inadequacy, difficulty in relationship with faculty, were given multiple assignments, have to devote long hours to study and lacked free time, timely feedback and faculty response to student's needs[1].

The second objective of this study to evaluate the post test level of stress among nursing students after calisthenic exercises intervention.

In general, 48.3% of students are having low level of stress score, 51.7% of them having moderate level of stress score and none of them are having high perceived level of stress score.

My study consistent with this study which is conducted by

Valarmathi.V,Tamil Selvaarasan.T and Judie.A (2016) Conducted study was to determine the effectiveness of aerobic dance movement therapy on academic stress among adolescents selected school at Kancheepuram district, Tamilnadu. Quasi experimental non equalent pre-test, post-test control group design was used.There are 268 students screened by the academic stress scale was developed by Dr.BalajiRao (2013) out of which 170 adolescents who had slightly stress, and moderate stress were selected 88 in study group and 82 in control group and the intervention was given for one month followed by

the post test was conducted. The analysis revealed that comparison of post test of study and control group mean and SD value of adolescents academic stress was found to be statistically highly significant with t= 6.14 at p<0.0001**

The third objective of this study is to determine the effectiveness of calisthenic exercises on stress among nursing students.

- On an average, students are reduced their stress from 23.12 to 14.18 after the administration of calisthenic exercise. Difference is 8.94, this difference is statistically significant. Statistical significance was calculated by using student's paired 't'test.
- Before calisthenic exercise, none of the students are having low level stress score and 70.0% of them having moderate level of stress score and 30.0% of them are having high perceived level of stress score.
- After calisthenic exercise, 48.3% of students are having low level of stress score, 51.7% of them having moderate level of stress score and none of them are having high perceived level of stress score.
- Level of stress reduction score between pre test and post test was calculated using Generalised McNemar'schisquare test.
- On an average, in post-test after having calisthenic exercises, students are reduced 22.35% stress score than pre test score.
- Differences and generalization of stress reduction score between pre-test and post test score was calculated using and mean difference with 95% CI and proportion with 95% CI.

My study consistent with a study which was conducted by

Murrow L JL, Lopez AD (2009) conducted study was in 2009 on effects of calisthenic exercise training on high risk behaviours. In which indices of hostility, depression and overall psychosocial stress were decreased by 50 – 70%. Data from a recent randomized trial demonstrated that exercise training can decrease depressive symptoms

as effectively as antidepressants. Stress has been linked to the onset of Illness and plays an etiological role in the disease process. It can worsen pain symptom and make the burden of disease harder to bear as well.

The fourth objective of this study is to find out the association between the level of stress in nursing students with their selected demographic variables.

- None of the demographic variables are significantly associated with their pre test level of stress score. Statistical significance was calculated using chi square test.
- The post test level of stress and their demographic variables of 19 -20years students, II year students, English medium students and urban students are reduced more stress score than others.
- Statistical significance was calculated using chi square test.

My study consistent with a study which was conducted by

Randal Beaton(2007) determined the relationship between stress level and academic achievement by survey method results showed that 30% of the student experienced high stress 20%of student experienced medium stress and 50% student's experienced low stress7 . The present study analysis revealed that effectiveness of aerobic dance movement therapy on academic stress was found to be statistically significant with $t= 6.14$ at $p<0.0001$.

Krishan Lal(2014), reported that academic stress among adolescent in relation to intelligence and demographic factors. The demographic factors such as (male and female) and (urban and rural) are not key factor in academic stress among high school students. However, all students of high school suffer from equal level of academic stress due to learning environment American International Journal of Research in Humanities, Arts and Social Sciences.

CHAPTER-VI

SUMMARY, IMPLICATION, RECOMMENDATION, LIMITATION AND CONCLUSION

This is the most creative part of this study .This chapter gives a brief account of the present study including summary, finding and conclusion draw from the findings, limitations, recommendations and nursing implications.

6.1. SUMMARY

Stress is a state of being under pressure. In modern usage stress refers to being under a great deal of emotional, mental and social pressure for a prolonged period of time. Social environment and situation is also considered stressful if there is lot of obstacles to communication and mutual tolerance. There is only 24 hours per day so calisthenic exercises are an efficient way to reduce stress in everyday life. It reprioritizes the goals and activities of the life which focuses on what is truly important and lets the trivial ones go. So the researcher conducted a study to assess the effectiveness of calisthenic exercises in reducing stress among nursing students in a selected college of nursing at Chennai. The data was collected for 4 weeks in selected college of nursing, Chennai from 02.01.2018 to 29.01. 2018. The collected data was analyzed by using the descriptive statistics (percentage, mean, standard deviation) and inferential statistics (student paired t test and chi square test). The study findings were discussed based on the objectives.

6.2. MAJOR FINDINGS OF THE STUDY

6.2.1. Findings of socio demographic profile of the nursing students.

Among 60 nursing students (61.7%) were 17 – 18 years of age group, (38.3%) were 19-20 years and none of them in the age group of 21 – 22 years.

According to basic education (90%) had +2 , (10%) had graduate . In case of religion (90%) were hindu, (5%) were muslim, and (5%) were Christian.

The year of study (50%) were from I year, (50%) were from II year.

According to occupation of their parents (21.7%) were private job, (8.3%) were government job, (3.3%) were business and (66.7%) were other than the private, government and business.

In family monthly income (40%) of students family income was below 10,000, (36.7%) was Rs. 10,000-15,000, (13.3%) was Rs.15,000-20,000, (10%) was >Rs. 20,000.

Regarding medium of instruction in higher secondary education (66.7 %) were tamil, (33.3%) were English.

In percentage of marks obtained in higher secondary (70%) were got above 90 percentage, (21.7%) were got 80-90 percentage, (8.3%) were got 70-80 percentage.

The type of family was (86.7%) were nuclear family, (10%) were joint family, (3.3%) were extended family.

Regarding residence (66.7%) was from rural, (23.3%) were from urban, (10%) were from semi urban.

Any problem in the family was (76.7%) didn't have any problem in their family, (23.3%) had financial problem.

Among nursing students average study time per day was (48.3%) were studying 1-2 hours, (33.4%) were studying less than 1 years, (18.3%) were studying more than 2 years.

Regarding leisure activities carried out in a day was (61.6%) were watching T.V, (20%) were involved other than exercise, gardening, playing, and watching T.V, (6.7%) were exercise, and none of them involved in gardening.

6.2.2 Finding the level of stress among nursing students before calisthenic exercises.

Before administering the calisthenic exercises, In general, none of the students are having mild level stress score and 70.0% of them having moderate level of stress score and 30.0%of them are having severe level of stress score.

6.2.3. Finding the level of stress among nursing students after calisthenic exercises.

In the post-test domain wise percentage of stress level in general, 48.3% of students are having mild level of stress score, 51.7% of them having moderate level of stress score and none of them are having severe level of stress score.

6.2.4. Finding the effectiveness of calisthenic exercises among nursing students

- On an average, students are reduced their stress from 23.12 to 14.18 after the administration of calisthenic exercise. Difference is 8.94, this difference is statistically significant. Statistical significance was calculated by using student's paired 't'test.
- Before calisthenic exercise, none of the students are having mild level stress score and 70.0% of them having moderate level of stress score and 30.0%of them are having severe level of stress score.
- After calisthenic exercise, 48.3% of students are having mild level of stress score, 51.7% of them having moderate level of stress score and none of them are having severe level of stress score.
- Level of stress reduction score between pre test and post test was calculated using Generalised McNemar'schisquare test.
- On an average, in post-test after having calisthenic exercises, students mean stress reduction score was 14.18, it shows there is a significant difference between the pretest and post test score.

- Differences and generalization of stress reduction score between pre-test and post test score was calculated using and mean difference with 95% CI and proportion with 95% CI.

6.2.5. Finding of an association of stress with the selected demographic variables

There is a close association in the level of stress reduction and their demographic variables of 19 -20years students, II year students, English medium students and urban students are reduced more stress score than others. Statistical significance was calculated using chi square test

6.3 IMPLICATION OF THE STUDY

The finding of the study has implications for nursing education, nursing practice, nursing research and nursing administration.

6.3.1. Nursing Education

- Nursing curriculum focuses to develop skills in identifying the stress level and its management.
- Conferences, workshops and seminars can be held for nurses to reduce stress and positive attitude.
- Arrange in-service education to update their knowledge regarding stress reduction measures.
- Make available literature related to calisthenic exercises.
- Arrange the CAM and AYUSH programme

6.3.2. Nursing Practice

- Psychiatric nurse must have the skills in teaching about stress reduction measures.
- Self-instructional material regarding reduction of stress can be distributed to the students
- The nurse must have the skills to avoid manual pressure.
- There is no need for any specific preparation to provide calisthenic exercises.

- Arrange aerobic dance movements weekly once.

6.3.3 Nursing Research

- This study will be a valuable reference material for further researcher.
- The results of study encourage the management to adopt calisthenic exercise for relieving stress.
- Adequate allocation of funds, manpower, time, adequate training should be provided to the nurses for conducting this research.
- Research can be done to find out the effectiveness of calisthenic exercises which helps to reduce stress among nursing students.

6.3.4. Nursing Administration

- Proposed to health administration to strategically plan and meet the health needs of risk group.
- The administration both private and Govt sectors should take initiatives to relieve stress.
- The administration can encourage the nurses for conducting research aspects for prevention of stress.
- The administration can organize conferences, workshops and seminars for nurses working in the hospital and other health care setting.

6.4 RECOMMENDATION

- Keeping in view, the finding of the present study can be used as a guide for future research.
- A similar study can be replicated with on a large sample in different setting
- A similar study can be conducted to assess the effectiveness of other complimentary therapies on stress.
- A longitudinal study can be undertaken to find out the long term effect of calisthenic exercises on stress.

6.5. LIMITATION OF THE STUDY

- The study was limited to the nursing students.
- The study was limited to the selected college of nursing at Chennai.
- The nursing students who were to participate in the study.
- The data collection was restricted only for 4 weeks.
- The stress level was assessed based on the score obtained.

6.6. CONCLUSION

Education in evidence based care gives the opportunity to nurses to improve their ability to use theoretical knowledge in practice. The study was conducted to find the effectiveness of calisthenic exercises on stress among nursing students. Calisthenic exercises which stimulate the brain function through physical activity and reduce the mental stress. So the investigator concluded that the calisthenic exercises are an appropriate method to reduce the stress.

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INTERVIEW ON A STUDY TO ASSESS THE EFFECTIVENESS OF CALISTHENIC EXERCISES IN REDUCING STRESS AMONG NURSING STUDENTS IN A SELECTED COLLEGE OF NURSING AT CHENNAI

(SOCIODEMOGRAPHIC VARIABLES) - PART-1

Instructions **SAMPLE NO:**

DATE:

This section deals with back ground issues and the level of stress among nursing students through the interview schedule will pose questions listed below and place a tick mark (□) in check box against correct response given by the respondent.

1) Age in years

a) 17-18yrs □

b) 19-20yrs □

c) 21-22yrs □

2) Basic Education

a) + 2 □

b) Graduate □

3) Religion

a)Hindu □

b) Muslim □

c) Christian □

d) Others □

4) Year of study

a) I Year □

b) II Year □

5) Occupation of parents

a)Government □

b) Private □

c) Business □

d) Others □

6) Monthly income

a) Below 10,000 □

b) 10,000 - 15,000 □

c) 15,000 - 20,000 □

d) Above 20,000 □

7) Medium of the instruction in higher secondary education

a) Tamil

b) English

8) Percentage of marks obtained in higher secondary

a) 70-80 percent

b) 80-90 percent

c) Above 90

9) Types of family

a) Nuclear

b) Joint

c) Extended

10) Residence

a) Rural

b) Urban

c) Semi urban

11) Any problems in the family

a) Nil

b) Financial problem

c) Others (specify) _____

12) Average study time per day

a) <1 hours

b) 1-2 hours

c) >2 hours

13) Leisure activities carried out in a day

a) Exercise

b) Gardening

c) Playing

d)Watching T.V

e) If any other …… (Specify)

Perceived Stress Scale

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the **Perceived Stress Scale**.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:
0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

_____ l. In the last month, how often have you been upset because of something that happened unexpectedly?

_____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?

_____ 3. In the last month, how often have you felt nervous and stressed?

_____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?

_____ 5. In the last month, how often have you felt that things were going your way?

_____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?

_____ 7. In the last month, how often have you been able to control irritations in your life?

_____ 8. In the last month, how often have you felt that you were on top of things?

_____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?

_____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Figuring Your PSS Score

You can determine your PSS score by following these directions:

- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this:

  0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.

- Now add up your scores for each item to get a total. **My total score is _____.**

- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.
  - ▶ Scores ranging from 0-13 would be considered low stress.
  - ▶ Scores ranging from 14-26 would be considered moderate stress.
  - ▶ Scores ranging from 27-40 would be considered high perceived stress.

The Perceived Stress Scale is interesting and important because your perception of what is happening in your life is most important. Consider the idea that two individuals could have the exact same events and experiences in their lives for the past month. Depending on their perception, total score could put one of those individuals in the low stress category and the total score could put the second person in the high stress category.

Disclaimer: *The scores on the following self-assessment do not reflect any particular diagnosis or course of treatment. They are meant as a tool to help assess your level of stress. If you have any further concerns about your current well being, you may contact EAP and talk confidentially to one of our specialists.*

CALISTHENIC EXERCISES

INTRODUCTION

Calisthenics exercises consisting of a variety of gross motor movements running, standing, grasping, pushing, etc. Calisthenic are aerobic and dynamic exercises performed rhythmically and with minimal equipment. divided into aerobic and anaerobic exercises They are intended to increase body strength, body fitness, and flexibility, through movements calisthenics can provide the benefits of muscular and aerobic conditioning, in addition to improving psychomotor skills such as balance, agility and coordination. Calisthenics also consider as "movement through space" which means you can move freely without any restriction blocking your full strength. Calisthenics also a part in physical education in primary and secondary schools.

MEANING

The word ***calisthenics*** derived from the Greek words ***kallos*** which means perfect or good or beauty (pleasure due to body perfection) and ***sthenos*** which means strength (great mental strength, courage, strength and determination).

HISTORY OF CALISTHENICS

Calisthenics originated in ancient Greece. Art of calisthenics passed from the Greeks to romans.527 BC shaolin monks are the first group of warriors to use this exercise to increase mental and physical performance. In nineteenth century Germans popularized this exercise in gymnastics.

Calisthenics were intended solely for women, quickly became for both sexes. Health benefits of this exercises recognized beginning of twenty century.

BENEFITS OF CALISTHENIC EXERCISES

PHYSICAL BENEFITS OF CALISTHENIC EXERCISES

- ✓ Build muscle and bone strength
- ✓ Increase flexibility and burn fat
- ✓ Increasing endurance
- ✓ Promotes life longer
- ✓ Improves the ability of daily activities

- ✓ Improves the mental health and mood
- ✓ Reducing the risk of type 2 diabetes
- ✓ Reduction of cardiovascular disease
- ✓ Maintain body weight
- ✓ Exercise boosts energy
- ✓ Promotes better sleep
- ✓ Reduces Fatigue

MENTAL AND EMOTIONAL BENEFITS OF CALISTHENIC EXERCISES

- Increased production of endorphins
- increases resilience to stress
- Sharper the memory and thinking
- Increase the sense of self worth
- Higher the self esteem
- Regulate and promote sleep
- Boost up the immune system and reduce the impact of stress
- Stronger resilience
- Improve concentration, motivation, memory, and mood
- Alleviate the symptoms anxiety and depression
- Increases pain tolerance

COGNITIVE BENEFITS OF CALISTHENIC EXERCISE

- ✓ improves executive functions
- ✓ Increasing focus and attention
- ✓ Promotes cognitive flexibility
- ✓ exercise in one path it can increases the willpower
- ✓ helps in control your emotions
- ✓ makes think faster
- ✓ helps in battle the depression
- ✓ Improves Academic Performance

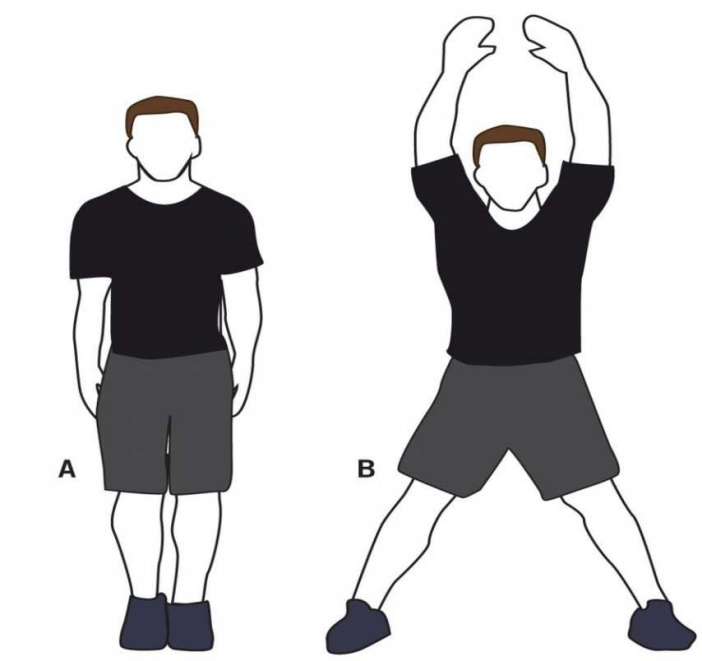
ADVANTAGES OF CALISTHENICS EXERCISES

- ✓ Calisthenic exercises doesn't require any special equipment
- ✓ Calisthenics exercises it can be performed anywhere and anytime

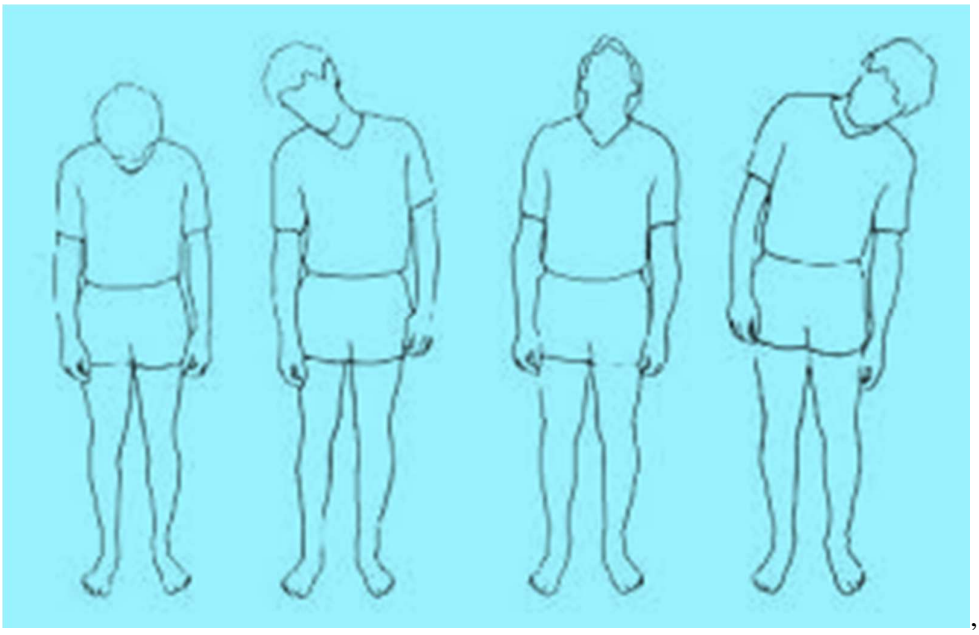
- ✓ It can be performed by everyone regardless of age
- ✓ Anyone can perform this form of exercise free of cost

KIND OF CALISTHENIC EXERCISES

1. JUMPING JACKS



2. NECK ROLLS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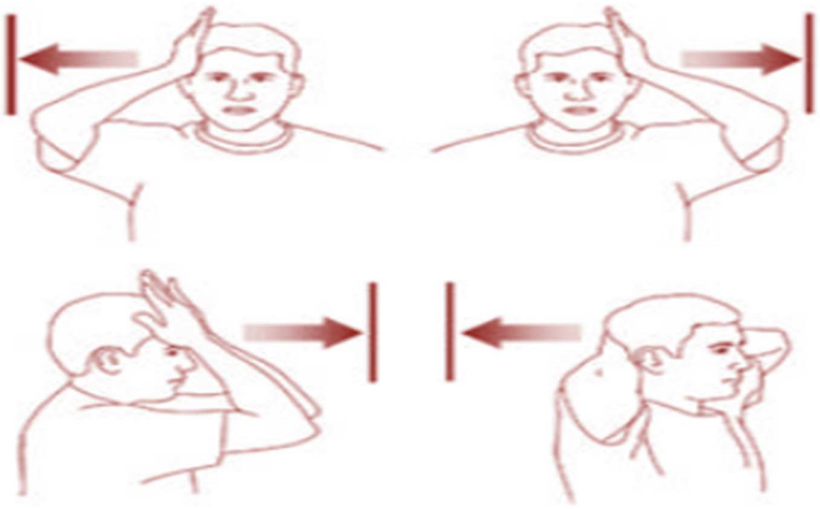
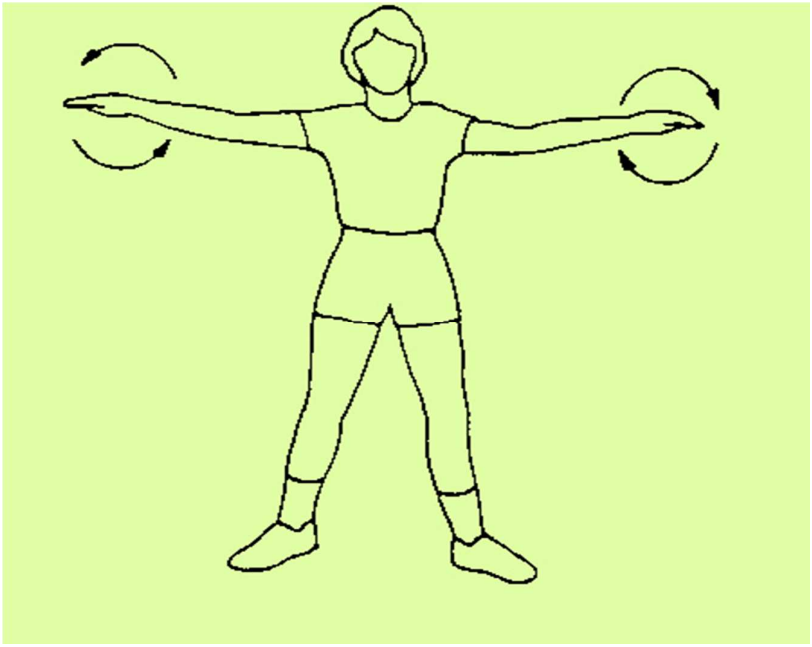
3. FREE HAND NECK RESISTANCE

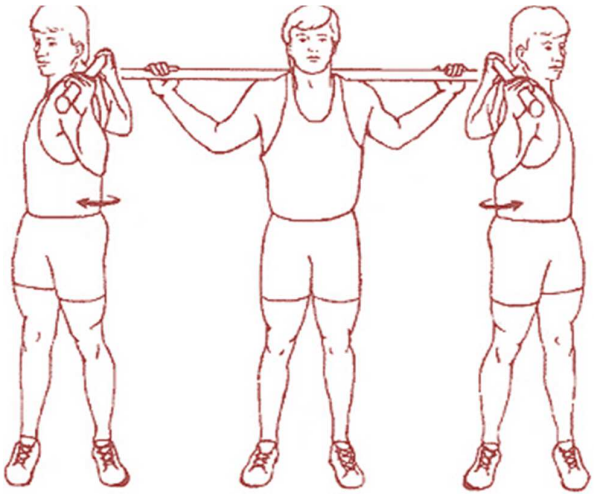


4. ARM CIRCLES

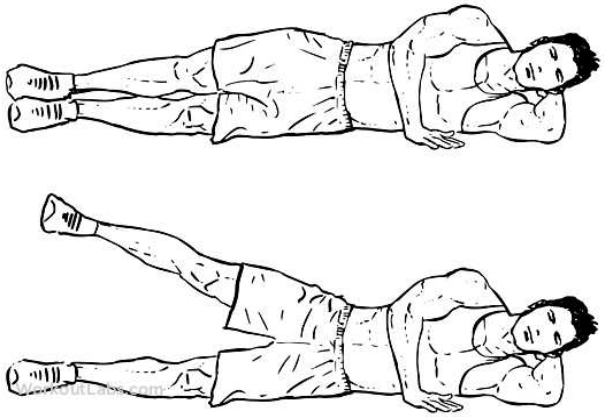


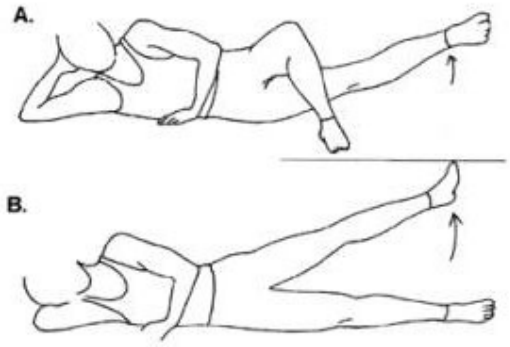
5. ALTERNATING TOE TOUCHES

6. TRUNK TWISTS

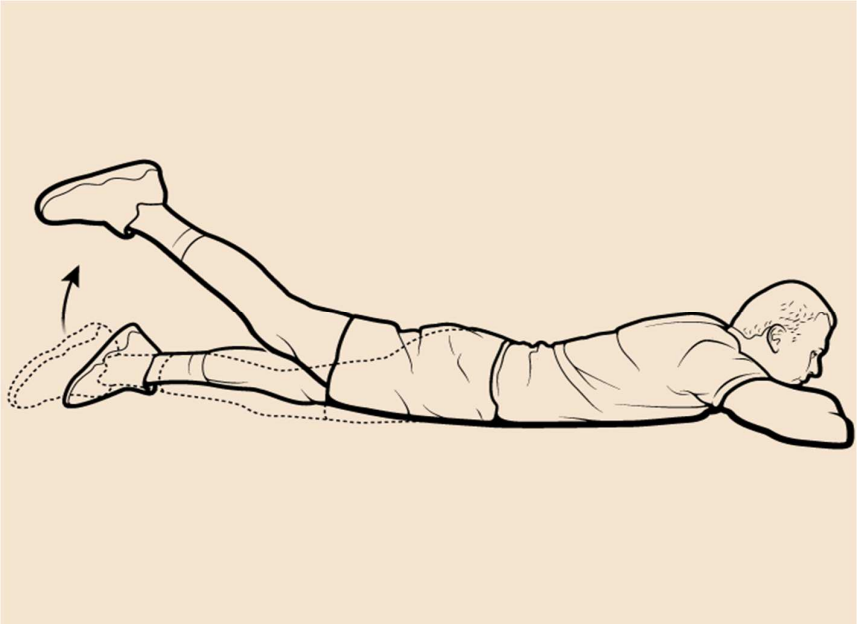


7. ABDUCTOR/ADDUCTOR LEG RAISE





8. *PRONE LEG EXTENSION*



9. *STANDING ONE LEGGED TOE RAISE*